

BOGSC INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC  
 Edition : 05.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 838  
 Injection pump  
 Pump designation : PES6P100A320LS3306  
 EP type number : 0 412 006 703  
 Governor  
 Governor design. : RQV350...1200PA1042K  
 Governor no. : 0 421 815 320

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 058

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 14.00...17.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.30 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm3/ : 15.9...16.1  
 100 s: (15.7...16.3)  
 Spread cm3 : 0.8  
 100 s: (1.2)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.8...6.0  
 Del.quantity cm3/ : 1.7...2.1  
 100 s: (1.5...2.4)  
 Spread cm3 : 0.4  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 500  
 travel mm : 3.50...3.90  
 3rd speed rpm : 800  
 travel mm : 6.20...6.60  
 4th speed rpm : 1250  
 travel mm : 9.30...9.50  
 5th speed rpm : 1400  
 travel mm : 10.50...11.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1440  
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1200

Del.quantity : 159.5...161.5  
1000 : (157.5...163.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1240...1270  
2nd rack travel in: 4.00  
Speed rpm : 1435...1445  
4th rack travel in: 1530  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 350...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 1200  
Rack travel in m: 14.60...14.80  
3rd speed rpm : 600  
Rack travel in m: 12.90...13.30

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.70

#### Measurement

Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 10.40...10.80  
2nd pressure hPa : 300  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 660

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Rack travel in m: 13.50...13.90

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (158.0...166.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1200  
Del.quantity cm3/ : 96.5...100.5  
1000 s: (94.5...102.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1240...1270

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 17.5...21.5  
1000 s: (15.0...24.0)  
Spread cm3 : 4.00  
1000 s: (6.50)

#### Remarks:

: NAVISTAR #1819913C91

Delivery-valve spring pre-tension =  
6.00...6.10 mm.  
Permissible alteration from 5.70...6.30  
mm

#### Bow dimension:

Sliding-sleeve position = 37.0 mm  
Limit shutoff stop screw to 1.0 mm.

Start-of-delivery blocking at start of  
delivery of cylinder no. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC  
 Edition : 03.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 839  
 Injection pump  
 Pump designation : PES6P100A320LS3306  
 EP type number : 0 412 006 703  
 Governor  
 Governor design. : RQV350...1200PA1042-  
 1K  
 Governor no. : 0 421 815 322

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-466

1st version kw : 172.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 058

Inlet press., bar : 2.80

Overflow  
 quantity min. 1/h: 240...260

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
 Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 14.00...17.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 16.1...16.3

100 s: (15.9...16.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del. quantity cm<sup>3</sup>/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 500  
 travel mm : 3.50...3.90

3rd speed rpm : 800  
 travel mm : 6.20...6.60

4th speed rpm : 1250  
 travel mm : 9.30...9.50

5th speed rpm : 1400  
 travel mm : 10.50...11.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1440

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 800  
Aneroid pressure h: 1200  
Del.quantity : 161.5...163.5  
1000 : (159.5...165.5)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1240...1270  
2nd rack travel in: 4.00  
Speed rpm : 1430...1440  
4th rack travel in: 1530  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.70  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1200  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 650  
Rack travel in m: 13.40...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 14.30...14.50

Measurement  
Speed 1/min : 1200

1st pressure hPa : -

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Rack travel in m: 10.30...10.70  
2nd pressure hPa : 310  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 655  
Rack travel in m: 13.00...13.40

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 156.5...160.5  
1000 s: (154.5...162.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 85.0...89.0  
1000 s: (83.0...91.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1240...1270

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 15.0...19.0  
1000 s: (12.5...21.5)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (6.50)

#### Remarks:

: NAVISTAR #1819914C91

Delivery-valve spring pre-tension =  
6.00...6.10 mm.  
Permissible alteration from 5.70...6.30  
mm

Bow dimension:

Sliding-sleeve position = 37.0 mm  
Limit shutoff stop screw to 1.0 mm.

Start-of-delivery blocking at start of  
delivery of cylinder no. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC  
 Edition : 03.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 845  
 Injection pump  
 Pump designation : PES6P100A320LS3309  
 EP type number : 0 412 006 704  
 Governor  
 Governor design. : RQV350...1300PA1042-  
 6K  
 Governor no. : 0 421 815 320

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-408

1st version kW : 142.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 058

Inlet press., bar : 2.80

Overflow  
 quantity min. 1/h: 240...260

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 14.00...17.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.60...2.00

2nd speed rpm : 500  
 travel mm : 3.80...4.20

3rd speed rpm : 800  
 travel mm : 5.80...6.20

4th speed rpm : 1300  
 travel mm : 8.90...9.10

5th speed rpm : 1500  
 travel mm : 10.40...10.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 8.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 136.5...138.5  
1000 : (134.5...140.5)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1340...1370  
2nd rack travel in: 4.00  
Speed rpm : 1500...1510  
4th rack travel in: 1530  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 350...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1300  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 700  
Rack travel in m: 11.40...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 12.40...12.60

Measurement  
Speed 1/min : 1200

1st pressure hPa : -

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Rack travel in m: 9.50...9.90  
2nd pressure hPa : 250  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 600  
Rack travel in m: 11.60...12.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 134.0...138.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 87.0...91.0  
1000 s: (85.0...93.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1340...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (6.50)

Remarks:  
: NAVISTAR #1819922C91

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
Limit shutoff stop screw to 1.0 mm.

Start-of-delivery blocking at start of

delivery of cylinder no. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : AIF  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 847  
 Injection pump  
 Pump designation : PES6P120A720RS3316  
 EP type number : 0 412 026 761  
 Governor  
 Governor design. : RQV300...1200PA1045  
 Governor no. : 0 421 814 043

Customer-spec. information  
 Customer : IVECO-AIFO

Engine : 8361 SRM 37

1st version kW : 272.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 13.90...14.00  
 Del. quantity cm<sup>3</sup>/ : 24.3...24.5  
 100 s : (24.0...24.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 3.0...3.4  
 Del. quantity cm<sup>3</sup>/ : 2.3...2.9  
 100 s : (2.0...3.2)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1245  
 travel mm : 7.60...7.80  
 2nd speed rpm : 300  
 travel mm : 0.70...0.90  
 3rd speed rpm : 700  
 travel mm : 3.20...3.80  
 4th speed rpm : 1550  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1360  
 Rack travel in mm : 11.60...14.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Aneroid pressure h: 900  
 Del. quantity : 243.0...245.0  
 1000 : (240.0...248.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 57...65

Testing:  
Speed rpm : 300  
Minimum rack travel: 4.70  
Speed rpm : 300  
Rack travel in mm : 3.10...3.30  
Rack travel in mm : 2.00  
Speed rpm : 355...415

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.90...14.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...8.80  
2nd pressure hPa : 440  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 320  
Rack travel in m: 9.90...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 267.0...273.0  
1000 s: (264.0...276.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 151.0...153.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1240...1250

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 03.02.93  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 065 700

Injection pump  
 Pump designation : PES5P110A720/3LS3218  
 -1

EP type number : 0 412 015 703

Governor  
 Governor design. : RSV350...1100POA487-  
 7

Governor no. : 0 421 833 314

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM449

1st version kW : 140.0

Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X1.50X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.7

Del. quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del. quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101



Testing:

1st rack travel in: 9.80  
Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 6.30...6.70  
Rack travel in mm : 2.00  
Speed rpm : 400...460

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 111.0...115.0  
1000 s: (108.0...118.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 11.01.93  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 076 745

Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV625...1100P2A534  
 -9

Governer no. : 0 421 833 372

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kw : 205.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.90

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.2...17.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 625.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 2.7...3.1

100 s: (2.4...3.3)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.5...176.5

1000 : (172.5...178.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 625  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 625  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 645  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 840  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 187.0...191.0  
1000 s: (185.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 625  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 27.0...31.0  
1000 s: (24.5...33.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks: : JOHN DEERE # RE47399

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 748  
 Injection pump  
 Pump designation : PES6P110A72ORS3305  
 EP type number : 0 412 016 740  
 Governor  
 Governor design. : RSV300...1100P1A555  
 Governor no. : 0 421 833 379

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 926 TI

1st version kw : 210.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 15.40...15.50

Del. quantity cm<sup>3</sup>/ : 18.5...18.7

100 s: (18.2...18.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 7.3...7.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1300

Del. quantity : 185.0...187.0

1000 : (182.5...189.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 14.40

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1080...1110  
3rd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1260  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.9  
Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 15.40...15.50  
2nd speed rpm : 500  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : 1300  
Rack travel mm : 15.40...15.50

#### Measurement

Speed 1/min : 550

1st pressure hPa : -  
Rack travel in m: 13.40...13.60  
2nd pressure hPa : 510  
Rack travel in m: 13.70...13.80  
3rd pressure hPa : 640  
Rack travel in m: 14.90...15.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.5...153.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.40

Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (141.0...169.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 748A  
 Injection pump  
 Pump designation : PES6P110A72ORS3305  
 EP type number : 0 412 016 740  
 Governor  
 Governor design. : RSV300...1100P1A555  
 Governor no. : 0 421 833 379

Cust. part no. : 9271058

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 926 TI

1st version kW : 210.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 15.40...15.50

Del.quantity cm<sup>3</sup>/ : 18.5...18.7

100 s: (18.2...18.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1300

Del.quantity : 185.0...187.0

1000 : (182.5...189.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 14.40  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
3rd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1260  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.9  
Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 15.40...15.50  
2nd speed rpm : 500  
Rack travel in m: 15.40...15.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : 1300  
Rack travel mm : 15.40...15.50

#### Measurement

Speed 1/min : 550

1st pressure hPa : -  
Rack travel in m: 13.40...13.60  
2nd pressure hPa : 510  
Rack travel in m: 13.70...13.80  
3rd pressure hPa : 640  
Rack travel in m: 14.90...15.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.5...153.5)

#### BREAKAWAY

#### 1st version

A19

1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (141.0...169.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 11.G1.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 752  
 Injection pump  
 Pump designation : PES6P110A720RS3144  
 EP type number : 9 410 231 035  
 Governor  
 Governor design. : RSV400...1050POA513  
 -2  
 Governor no. : 0 421 833 339

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6619 A

1st version kw : 215.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 9 681 271 004

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 21.7...21.9  
 100 s: (21.5...22.1)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.8...6.0  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (1.7...2.6)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 900  
 Del.quantity : 217.0...219.0  
 1000 : (215.0...221.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 41...49

Testing:  
 1st rack travel in: 12.60  
 Speed rpm : 1100...1110



2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
3rd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1280  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.40...14.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 240  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 720  
Rack travel in m: 14.00...14.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 600  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 229.0...233.0  
1000 s: (227.0...235.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE23749

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 13° cam angle  
after start of delivery cyl. 1.

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 753  
 Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534  
 -13  
 Governor no. : 0 421 833 403

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 AF & HF  
 1st version kw : 186.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 12.20...12.30  
 Del. quantity cm<sup>3</sup>/ : 15.5...15.7  
 100 s: (15.3...15.9)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.5...5.7  
 Del. quantity cm<sup>3</sup>/ : 2.5...2.9  
 100 s: (2.3...3.2)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 155.0...157.0  
 1000 : (153.0...159.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 44...52

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1225...1235  
3rd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...5.70

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 650  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 590  
Rack travel in m: 11.30...11.70  
3rd pressure hPa : 850  
Rack travel in m: 12.70...12.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 187.0...191.0  
1000 s: (185.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 118.0...122.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1150...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 25.5...29.5  
1000 s: (23.0...32.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks: : JOHN DEERE # RE50748

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 754  
 Injection pump  
 Pump designation : PES6P120A720RS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534  
 -14  
 Governor no. : 0 421 833 405

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HFO30

1st version kW : 205.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 16.8...17.0

100 s: (16.6...17.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del. quantity cm<sup>3</sup>/ : 2.0...2.4

100 s: (1.8...2.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del. quantity : 168.0...170.0

1000 : (166.0...172.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1185...1195  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 750  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 465  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 730  
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 174.5...178.5  
1000 s: (172.5...180.5)  
Aneroid pressure h: -  
Speed rpm : 800

A25

Del.quantity cm3/ : 117.5...121.5  
1000 s: (114.5...124.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (18.0...26.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47410

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MTJ  
 Edition : 11.2.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 436 042  
 Injection pump  
 Pump designation : PE6ZW150/120RS1007  
 /11  
 Governor  
 Governor design. : RQUV300...1200ZWA50R  
 Governor no. : 0 422 409 026

Customer-spec. information  
 Customer : MTU

Engine : 331

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 443 022

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 027

Outside diameter  
 x Wall thickness  
 x Length mm : 8,00x2,00x1500

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Rack travel in mm : 12.00  
 Firing order : 6-1-2-3-4-5

Phasing : 0-75-120-195-240-315  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 18.00  
 Del. quantity cm<sup>3</sup>/ : 49.7...50.7  
 100 s : (49.4...51.0)  
 Spread cm<sup>3</sup> : 1.5  
 100 s : (2.2)

2nd speed rpm : 600  
 Rack travel in mm : 9.00  
 Del. quantity cm<sup>3</sup>/ : 13.1...15.1  
 100 s : (12.6...15.6)  
 Spread cm<sup>3</sup> : 1.6  
 100 s : (2.4)  
 3rd speed rpm : 300  
 Rack travel in mm : 9.00  
 Del. quantity cm<sup>3</sup>/ : 7.0...9.0  
 100 s : (6.5...9.5)  
 Spread cm<sup>3</sup> : 1.0  
 100 s : (1.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 82...88  
 Speed rpm : 1200  
 Rack travel in mm : 17.5...18.5

RATED SPEED

1st version  
 Control lever  
 position degrees: 82...88

Testing:  
 1st rack travel in: 17.00  
 Speed rpm : 1230...1240  
 3rd rack travel in: 6.40...11.60  
 Speed rpm : 1300  
 4th rack travel in: 1420  
 Speed rpm : 0.00...2.00

LOW IDLE 1

Control lever  
 position degrees: 20.0...26.0  
 Setting point w/out bumper spring  
 Speed rpm : 300  
 Rack travel in mm : 8.00

Testing:  
 Speed rpm : 150  
 Minimum rack travel: 15.20

Speed rpm : 400  
Rack travel in mm : 2.80...4.30  
Rack travel in mm : 3.80  
Speed rpm : 380...420  
Speed rpm : 570  
Maximum rack trave: <0.01

#### LOW IDLE 2

Control lever  
position degrees: 27...33

#### Testing:

Speed rpm : 250  
Rack travel in mm : 12.2...14.6  
Speed rpm : 375  
Rack travel in mm : 6.00...7.20  
Speed rpm : 600  
Rack travel in mm : 0.80...2.10  
Speed rpm : 730  
Rack travel in mm : <0.01

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 17.00  
Speed rpm : 1230...1240

#### Remarks:

Full-load delivery is set on engine  
according to engine test report.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 b3  
 Edition : 18.12.92  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 830  
 Injection pump  
 Pump designation : PE12P120A520LS7824-2  
 EP type number : 0 412 620 816  
 Governor  
 Governor design. : RQV300...1150PA902-4  
 Governor no. : 0 421 813 870

Customer-spec. information  
 Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness : 8.00x2.50x1000  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.70...13.80  
 Del. quantity cm<sup>3</sup>/ : 30.4...30.6  
 100 s: (30.1...30.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.1...9.3  
 Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s: (14.6...15.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)  
 3rd speed rpm : 300  
 Rack travel in mm : 7.20...7.40  
 Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
 100 s: (-)  
 Spread cm<sup>3</sup> : -  
 100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 300  
 travel mm : 1.20...1.60  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.60...6.00  
 4th speed rpm : 1150  
 travel mm : 9.50...9.70  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1



Speed rpm : 1270  
Rack travel in mm : 11.40...14.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 304.0...306.0  
1000 : (301.0...309.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 118...126

##### Testing:

1st rack travel in: 12.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 79...87

##### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.70...13.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 100  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 470  
Rack travel in m: 12.20...12.60

#### START CUT-OUT

801

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.5...21.0

#### HIGH IDLE

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

##### 2nd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

##### 3rd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : 8.40...8.60  
Del.quantity cm<sup>3</sup>/ : 125.0...200.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7153

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 e2  
 Edition : 18.12.92  
 Replaces : 03.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 833  
 Injection pump  
 Pump designation : PE12P120A520LS7829-1  
 EP type number : 0 412 620 827  
 Governor  
 Governor design. : RQV300...1150PA943-1  
 Governor no. : 0 421 813 869

Customer-spec. information

Customer : MAN  
 Engine : D2842LZE

1st version kW : 809.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 14.90...15.00  
 Del. quantity cm<sup>3</sup>/ : 33.7...33.9  
 100 s : (33.4...34.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.0...9.2  
 Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s : (14.6...15.4)  
 Spread cm<sup>3</sup> : 8.0  
 100 s : (1.2)  
 3rd speed rpm : 300  
 Rack travel in mm : 7.30...7.50  
 Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
 100 s : (-)  
 Spread cm<sup>3</sup> : -  
 100 s : (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.60  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.70...6.10  
 4th speed rpm : 1150  
 travel mm : 9.50...9.70  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1260  
Rack travel in mm : 12.60...15.20

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del. quantity : 337.0...339.0  
1000 : (334.0...342.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 120...128

##### Testing:

1st rack travel in: 13.90  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

##### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50

#### CONSTANT REGULATION

Speed rpm : 280...410

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 14.90...15.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 100  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 470  
Rack travel in m: 12.40...12.80

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del. quantity cm3/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.5...21.0

#### HIGH IDLE

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.00  
Del. quantity cm3/ : - \*\*  
1000 s: (-)

##### 2nd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.50  
Del. quantity cm3/ : < 50.0  
1000 s: (-)

##### 3rd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : 8.50...8.70  
Del. quantity cm3/ : 125.0...  
1000 s: (-)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7156

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 838  
 Injection pump  
 Pump designation : PE12P120A520LS7829-1  
 EP type number : 0 412 620 827  
 Governor  
 Governor design. : RQV300...1150PA1039-1K  
 Governor no. : 0 421 815 315

Customer-spec. information  
 Customer : MAN

Engine : D2842LE401

1st version kW : 735.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 Phasing : 180-225-240-285-300-  
 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.80...13.90  
 Del. quantity cm<sup>3</sup>/ : 30.4...30.6  
 100 s : (30.1...30.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.9...10.1  
 Del. quantity cm<sup>3</sup>/ : 16.9...17.1  
 100 s : (16.6...17.4)  
 Spread cm<sup>3</sup> : -  
 100 s : (-)  
 3rd speed rpm : 300  
 Rack travel in mm : 6.70...6.90  
 Del. quantity cm<sup>3</sup>/ : 4.0...5.0 \*  
 100 s : (-)  
 Spread cm<sup>3</sup> : -  
 100 s : (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 2.00...2.20  
 2nd speed rpm : 450  
 travel mm : 4.00...4.40  
 3rd speed rpm : 800  
 travel mm : 6.70...7.10  
 4th speed rpm : 1200  
 travel mm : 10.30...10.50  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1  
Speed rpm : 1280  
Rack travel in mm : 10.80...14.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1300  
Del. quantity : 304.0...306.0  
1000 : (301.0...309.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.80  
Speed rpm : 1195...1210  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90

#### CONSTANT REGULATION

Speed rpm : 270...390

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 900  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

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Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 400  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 850  
Rack travel in m: 12.40...12.70

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 254.0...260.0  
1000 s: (251.0...263.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)  
Aneroid pressure h: 1300  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 274.0...280.0  
1000 s: (271.0...283.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 169.0...171.0  
1000 s: (166.0...174.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1195...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 18.2...21.0

#### HIGH IDLE

1st version  
Speed rpm : 500  
Rack travel in mm : 0.00...7.00

Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : 0.00...7.50  
Del.quantity cm<sup>3</sup>/ : 0...50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.50...8.70  
Del.quantity cm<sup>3</sup>/ : 125.0...  
1000 s: (-)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Del.quantity cm<sup>3</sup>/ : 40.0...50.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7226

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 839  
 Injection pump  
 Pump designation : PE12P120A520LS7829-1  
 EP type number : 0 412 620 827  
 Governor  
 Governor design. : RQV300...1150PA1039K  
 Governor no. : 0 421 315 314

Customer-spec. information

Customer : MAN  
 Engine : D2842LE402  
 1st version kW : 809.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 14.80...14.90  
 Del. quantity cm<sup>3</sup>/ : 33.7...33.9  
 100 s : (33.4...34.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.9...10.1  
 Del. quantity cm<sup>3</sup>/ : 16.9...17.1  
 100 s : (16.6...17.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)  
 3rd speed rpm : 300  
 Rack travel in mm : 6.70...6.90  
 Del. quantity cm<sup>3</sup>/ : 4.0...5.0 \*  
 100 s : (-)  
 Spread cm<sup>3</sup> : -  
 100 s : (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 2.00...2.20  
 2nd speed rpm : 450  
 travel mm : 4.00...4.40  
 3rd speed rpm : 800  
 travel mm : 6.70...7.10  
 4th speed rpm : 1200  
 travel mm : 10.30...10.50  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1265  
Rack travel in mm : 11.70...15.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 337.0...339.0  
1000 : (334.0...342.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1195...1210  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90

CONSTANT REGULATION  
Speed rpm : 270...390

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 700  
Rack travel in m: 13.50...13.70  
3rd speed rpm : 900  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1300  
Rack travel mm : 14.80...14.90

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 400  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 850  
Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300  
Speed rpm : 700  
Del.quantity cm3/ : 287.0...293.0  
1000 s: (284.0...296.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm3/ : 307.0...313.0  
1000 s: (304.0...316.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 169.0...171.0  
1000 s: (166.0...174.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1195...1210

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm3/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 18.2...21.0

HIGH IDLE

1st version  
Speed rpm : 500

Rack travel in mm : 0.00...7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : 0.00...7.50  
Del.quantity cm<sup>3</sup>/ : 0.0...50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.50...8.70  
Del.quantity cm<sup>3</sup>/ : 125.0...  
1000 s: (-)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Del.quantity cm<sup>3</sup>/ : 40.0...50.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7227

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 646 607

Injection pump  
 Pump designation : PE6P130A720RS7270  
 EP type number : 0 412 636 821  
 Governor  
 Governor design. : RQV300...950PA946-4  
 Governor no. : 0 421 814 026

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42P.032

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 13.50...14.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 950

---

Rack travel in mm : 11.30...11.40

---

Del. quantity cm<sup>3</sup>/ : 21.1...21.3

---

100 s : (20.8...21.6)

---

Spread cm<sup>3</sup> : 0.5

---

100 s : (0.8)

2nd speed rpm : 275.0  
 Rack travel in mm : 4.5...4.9  
 Del. quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s : (1.6...2.8)

Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
 travel mm : 8.40...8.60

2nd speed rpm : 300  
 travel mm : 1.10...1.30

3rd speed rpm : 450  
 travel mm : 2.80...3.40

4th speed rpm : 650  
 travel mm : 4.40...5.00

5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1060  
 Rack travel in mm : 9.00...11.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 950  
 Aneroid pressure h: 1000  
 Del. quantity : 211.0...213.0  
 1000 : (208.0...216.0)

Spread cm3 : 5.00  
1000 : (8.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 275...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 260  
Rack travel in m: 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm3/ : 213.0...219.0  
1000 s: (210.0...222.0)  
Aneroid pressure h: -

Speed rpm : 550  
Del.quantity cm3/ : 184.0...186.0  
1000 s: (181.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.50...4.90  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (16.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN  
 Edition : 21.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 610  
 Injection pump  
 Pump designation : PE6P130A720RS7273  
 EP type number : 0 412 636 823  
 Governor  
 Governor design. : RQV250...900PA881-2  
 Governor no. : 0 421 814 035

Customer-spec. information  
 Customer : PENTA

Engine : TAD 1630 P

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 38.3...38.6

100 s: (38.0...39.0)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

2nd speed rpm : 250.0  
 Rack travel in mm : 4.3...4.5  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.00...2.60  
 3rd speed rpm : 700  
 travel mm : 4.50...5.10  
 4th speed rpm : 925  
 travel mm : 7.60...7.80  
 5th speed rpm : 985  
 travel mm : 8.40...8.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 980  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1600  
 Del. quantity : 383.5...386.5  
 1000 : (380.0...390.0)

Spread cm<sup>3</sup> : 7.00  
1000 : (11.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 11.40  
Speed rpm : 960...970  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1180  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 250  
Rack travel in mm : 4.30...4.50

#### CONSTANT REGULATION

Speed rpm : 250...420

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1600  
Rack travel mm : 12.40...12.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 500  
Rack travel in m: 9.10...9.20  
3rd pressure hPa : 980  
Rack travel in m: 11.90...12.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 249.5...252.5  
1000 s: (246.0...256.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 960...970

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.30...4.50  
Del. quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (11.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN  
 Edition : 03.C2.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 617  
 Injection pump  
 Pump designation : PE6P130A32ORS7282  
 EP type number : 0 412 636 825  
 Governor  
 Governor design. : RQV300...900PA1059  
 Governor no. : 0 421 814 049

Customer-spec. information  
 Customer : PENTA

Engine : TAD 1230 P

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 11.00...11.10  
 Del. quantity cm<sup>3</sup>/ : 32.1...32.4  
 100 s: (31.8...32.8)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.1)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.4...4.6  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.5  
 100 s: (1.8...2.8)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.50...1.90  
 2nd speed rpm : 450  
 travel mm : 3.20...3.80  
 3rd speed rpm : 700  
 travel mm : 5.20...5.80  
 4th speed rpm : 915  
 travel mm : 7.50...7.70  
 5th speed rpm : 1000  
 travel mm : 8.40...8.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 980  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1800  
 Del. quantity : 321.5...324.5  
 1000 : (318.0...328.0)



Spread cm<sup>3</sup> : 7.00  
1000 : (11.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 10.00  
Speed rpm : 910...920  
2nd rack travel in: 4.00  
Speed rpm : 985...1015  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 67...75

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 300  
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION  
Speed rpm : 300...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1800  
Rack travel mm : 11.00...11.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.00...8.20  
2nd pressure hPa : 1100  
Rack travel in m: 10.70...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 210.5...213.5  
1000 s: (207.0...217.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 910...920

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.40...4.60  
Del. quantity cm<sup>3</sup>/ : 20.5...25.5  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (11.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 787  
 Injection pump  
 Pump designation : PE6P120A32CLS7858  
 EP type number : 0 412 626 875  
 Governor  
 Governor design. : RQ300/1050PA1031-12  
 Governor no. : 0 421 801 631

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 180.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 100...120

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 300  
Rack travel in m: 10.60...10.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 788  
 Injection pump  
 Pump designation : PE6P120A320LS7858  
 EP type number : 0 412 626 875  
 Governor  
 Governor design. : RQ300/1050PA1031-11  
 Governor no. : 0 421 801 680

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 200.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 11.70...11.80  
 Del. quantity cm<sup>3</sup>/ : 18.9...19.1  
 100 s: (18.6...19.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 800  
 Del. quantity : 189.0...191.0  
 1000 : (186.0...194.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.90

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 350  
Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (179.0...189.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.C1.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 789  
 Injection pump  
 Pump designation : PE6P120A320LS7846  
 EP type number : 0 412 626 865  
 Governor  
 Governor design. : RQ300/1050PA1031-10  
 Governor no. : 0 421 801 679

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del. quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.40  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 450  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 195.0...199.0  
1000 s: (192.0...202.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 05.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 790  
 Injection pump  
 Pump designation : PE6P120A320LS7864  
 EP type number : 0 412 626 879  
 Governor  
 Governor design. : RG1350...1050PA1052  
 -2  
 Governor no. : 0 421 814 044

Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM401 LA, Euro 1  
 1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x wall thickness  
 x length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 12.40...12.50

Del. quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.00...1.50

2nd speed rpm : 453

travel mm : 2.30...2.80

3rd speed rpm : 770

travel mm : 4.70...5.20

4th speed rpm : 1108

travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 10.10...12.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1000



Del.quantity : 200.0...202.0  
1000 : (197.0...205.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.70  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 420...460

#### CONSTANT REGULATION

Speed rpm : 380...450

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 450  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

B25

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 200.0...204.0  
1000 s: (197.0...207.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 150.0...154.0 \*  
1000 s: (147.0...157.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 793  
 Injection pump  
 Pump designation : PE6P120A320LS7846  
 EP type number : 0 412 626 865  
 Governor  
 Governor design. : RQ300/1050PA1030-8  
 Governor no. : 0 421 801 673

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del. quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 450  
Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 195.0...199.0  
1000 s: (192.0...202.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 40.0...70.0  
1000 s: (36.0...74.0)  
Rack travel in mm : 9.90...10.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 j  
 Edition : 21.01.93  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 893  
 Injection pump  
 Pump designation : PE6P120A32ORS7202  
 EP type number : 0 412 626 835  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del. quantity cm<sup>3</sup>/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.3

Del. quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 217.0...219.0

1000 : (214.0...222.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.90

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 1000  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 320  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 190  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 153.0...155.0  
1000 s: (150.0...158.0)

#### BREAKAWAY

#### 1st version

CO1

1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del. quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k6  
 Edition : 21.C1.93  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 894  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 24.5...24.7

100 s: (24.2...25.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 245.0...247.0

1000 : (242.0...250.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.70

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 7.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 600  
1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 171.0...173.0  
1000 s: (168.0...176.0)

#### BREAKAWAY

#### 1st version

C03

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 j3  
 Edition : 18.12.92  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 895  
 Injection pump  
 Pump designation : PE6P120A32URS7202  
 EP type number : 0 412 626 835  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information

Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del. quantity cm<sup>3</sup>/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.3

Del. quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 2.50...3.10

3rd speed rpm : 700  
 travel mm : 4.50...4.90

4th speed rpm : 1045  
 travel mm : 7.80...8.00

5th speed rpm : 1350  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000



Del.quantity : 217.0...219.0  
1000 : (214.0...222.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 10.90  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...82

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 270...380

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 320  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 190  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 153.0...155.0  
1000 s: (150.0...158.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k4  
 Edition : 18.12.92  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 896  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 24.5...24.7

100 s: (24.2...25.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.70...1.10

2nd speed rpm : 400

travel mm : 2.50...3.10

3rd speed rpm : 700

travel mm : 4.50...4.90

4th speed rpm : 1045

travel mm : 7.80...8.00

5th speed rpm : 1350

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 245.0...247.0  
1000 : (242.0...250.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 12.70  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 81...89

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.90...7.10

#### CONSTANT REGULATION

Speed rpm : 275...385

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 171.0...173.0  
1000 s: (168.0...176.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.90...7.10

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L  
 Edition : 18.12.92  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 912  
 Injection pump  
 Pump designation : PE6P120A320RS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 268 G  
 1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 15.00...15.10  
 Del.quantity cm<sup>3</sup>/ : 23.7...23.9  
 100 s: (23.4...24.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 237.0...239.0  
 1000 : (234.0...242.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:  
Speed rpm : 550  
Rack travel in mm : 16.4

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

Del. quantity cm<sup>3</sup>/ : 167.0...169.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L1  
 Edition : 18.12.92  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 913  
 Injection pump  
 Pump designation : PE6P120A320RS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 268 G  
 1st version kw : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850  


---

 Rack travel in mm : 15.00...15.10  


---

 Del.quantity cm<sup>3</sup>/ : 23.7...23.9  


---

 100 s: (23.4...24.2)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

 2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.80...8.00  
 2nd speed rpm : 250  
 travel mm : 0.70...1.10  
 3rd speed rpm : 400  
 travel mm : 2.50...3.10  
 4th speed rpm : 700  
 travel mm : 4.50...4.90  
 5th speed rpm : 1350  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del. quantity : 237.0...239.0  
1000 : (234.0...242.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm3/ : 167.0...169.0  
1000 s: (164.0...172.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA  
 Edition : 11.01.93  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 938  
 Injection pump  
 Pump designation : PE6P120A720RS71880  
 EP type number : 0 412 626 846  
 Governor  
 Governor design. : RQ200/950PA745-3  
 Governor no. : 0 421 807 579

Customer-spec. information  
 Customer : SCANIA

Engine : D5C 11 21

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0,7  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.70...12.80  
 Del.quantity cm<sup>3</sup>/ : 21.9...22.1  
 100 s : (21.6...22.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1500  
 Del.quantity : 219.0...221.0  
 1000 : (216.0...224.0)  
 Spread cm<sup>3</sup> : 8.00  
 1000 : (12.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 16.5  
 Testing:  
 1st rack travel in: 11.70  
 Speed rpm : 995...1010  
 2nd rack travel in: 4.00  
 Speed rpm : 1085...1115



4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 4.7

Testing:

Speed rpm : 125  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 330...370

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 440  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 270  
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 202.0...210.0  
1000 s: (200.0...212.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (-)  
Rack travel in mm : 10.20...10.60

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,1 b 2  
 Edition : 03.02.93  
 Replaces : 11.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 956  
 Injection pump  
 Pump designation : PE6P120A320LS7837-1  
 EP type number : 0 412 626 858  
 Governor  
 Governor design. : RQV350...1050PA842-9  
 Governor no. : 0 421 813 955

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.05)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.70...1.30

2nd speed rpm : 470  
 travel mm : 2.60...3.10

3rd speed rpm : 940  
 travel mm : 5.20...5.70

4th speed rpm : 1106  
 travel mm : 6.70...7.20

5th speed rpm : 1263  
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1185

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70

CONSTANT REGULATION  
Speed rpm : 350...600

TORQUE CONTROL  
Dimension a mm : 0.60  
2nd speed rpm : 1050  
Rack travel in m: 14.50...14.70  
3rd speed rpm : 950  
Rack travel in m: 14.80...15.00  
4th speed rpm : 800  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 200  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 600

C15

Rack travel in m: 13.30...13.50  
3rd pressure hPa : 1250  
Rack travel in m: 14.60...14.80  
4th pressure hPa : -  
Rack travel in m: 8.90...9.20

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1800  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1800  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 247.0...251.0  
1000 s: (244.0...254.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 13  
 Edition : 18.12.92  
 Replaces : 01.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 963  
 Injection pump  
 Pump designation : PE6P120A320RS7218Y  
 EP type number : 0 412 626 859  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 242 G

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 14.30...14.40  
 Del. quantity cm<sup>3</sup>/ : 21.5...21.7  
 100 s: (21.2...22.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 550  
 Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del. quantity : 215.0...217.0  
 1000 : (212.0...220.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 16.4

Testing:

1st rack travel in: 13.30  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 1000  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.30...14.40

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 420  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 310  
Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 167.0...169.0  
1000 s: (164.0...172.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L4  
 Edition : 18.12.92  
 Replaces : 01.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 964  
 Injection pump  
 Pump designation : PE6P120A32ORS7218Y  
 EP type number : 0 412 626 859  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 242 G

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : ?

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 14.30...14.40  
 Del. quantity cm<sup>3</sup>/ : 21.5...21.7  
 100 s: (21.2...22.0)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.80...8.00  
 2nd speed rpm : 250  
 travel mm : 0.70...1.10  
 3rd speed rpm : 400  
 travel mm : 2.50...3.10  
 4th speed rpm : 700  
 travel mm : 4.50...4.90  
 5th speed rpm : 1350  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 215.0...217.0  
1000 : (212.0...220.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 77...85

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.30...14.40

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 420  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 310  
Rack travel in m: 13.10...13.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 600

Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)  
Spread cm3 : 10.00  
1000 s: (14.00)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 167.0...169.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1040...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 o 8  
 Edition : 18.12.92  
 Replaces : 03.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 965  
 Injection pump  
 Pump designation : PE6P120A320LS7834-1  
 EP type number : 0 412 626 857  
 Governor  
 Governor design. : RQV350...1050PA866  
 -19  
 Governor no. : 0 421 813 979

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA, Euro 1

1st version kw : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.50...5.60  
 : (5.45...5.55)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.10...14.30  
 Del. quantity cm<sup>3</sup>/ : 20.7...20.9  
 100 s: (20.4...21.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80  
 2nd speed rpm : 570  
 travel mm : 3.30...3.80  
 3rd speed rpm : 900  
 travel mm : 5.40...5.90  
 4th speed rpm : 1107  
 travel mm : 7.80...8.30  
 5th speed rpm : 1204  
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1125  
 Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del. quantity : 207.0...209.0  
1000 : (204.0...212.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.40...6.00

CONSTANT REGULATION  
Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1350  
Rack travel in m: 14.40...14.60  
4th pressure hPa : -  
Rack travel in m: 10.60...10.90

START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del. quantity cm3/ : 225.0...228.0  
1000 s: (222.0...231.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del. quantity cm3/ : 226.0...230.0  
1000 s: (223.0...233.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del. quantity cm3/ : 169.0...173.0 \*  
1000 s: (166.0...176.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA  
 Edition : 22.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 975  
 Injection pump  
 Pump designation : PE6P120A72ORS7188Y  
 EP type number : 0 412 626 864  
 Governor  
 Governor design. : RQV200...950PA725-9  
 Governor no. : 0 421 813 988

Customer-spec. information  
 Customer : SCANIA

Engine : DSC 11 38

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 104

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.6...5.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.40...1.80

2nd speed rpm : 350  
 travel mm : 2.30...2.90

3rd speed rpm : 650  
 travel mm : 5.20...5.80

4th speed rpm : 995  
 travel mm : 7.30...7.50

5th speed rpm : 1180  
 travel mm : 8.70...9.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1260

Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 12.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 125  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 440  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 270  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 216.0...224.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 152.0...154.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (-)  
Rack travel in mm : 10.20...10.60

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 05.02.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 976  
 Injection pump  
 Pump designation : PE6P120A320LS7846  
 EP type number : 0 412 626 865  
 Governor  
 Governor design. : RQ300/1050PA1031  
 Governor no. : 0 421 801 642

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 230.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del. quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.10  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.60...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 650  
Rack travel in m: 12.50...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
1000 s: (213.0...223.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...290.0  
1000 s: (266.0...294.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF  
 Edition : 03.02.93  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 988  
 Injection pump  
 Pump designation : PE6P120A32ORS7230X  
 EP type number : 0 412 626 868  
 Governor  
 Governor design. : RQV250...1000PA990K  
 Governor no. : 0 421 815 274

Customer-spec. information  
 Customer : DAF

Engine : WS 295 L

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 25.8...26.0

100 s: (25.5...26.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.30...1.70

2nd speed rpm : 285  
 travel mm : 2.10...2.50

3rd speed rpm : 685  
 travel mm : 6.20...6.60

4th speed rpm : 1030  
 travel mm : 9.60...10.00

5th speed rpm : 1145  
 travel mm : 11.20...11.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Aneroid pressure h: 1500

Del.quantity : 258.0...260.0

1000 : (255.0...263.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1275  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 320...380

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 400  
Rack travel in m: 12.10...12.30  
2nd speed rpm : 600  
Rack travel in m: 12.30...12.40  
3rd speed rpm : 825  
Rack travel in m: 13.30...13.50  
4th speed rpm : 980  
Rack travel in m: 14.20...14.40

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 980  
Pressure hPa : 1500  
Rack travel mm : 13.90...14.00

Measurement  
Speed 1/min : 980

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 730  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 300  
Rack travel in m: 9.70...9.90

C27

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 255.0...259.0  
1000 s: (252.0...262.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF  
 Edition : 18.12.92  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 989  
 Injection pump  
 Pump designation : PE6P120A32ORS7230Y  
 EP type number : 0 412 626 867  
 Governor  
 Governor design. : RQV250...1000PA990K  
 Governor no. : 0 421 815 274

Customer-spec. information  
 Customer : DAF

Engine : WS 315 L

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 105  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 980  
 Rack travel in mm : 14.50...14.60  
 Del.quantity cm<sup>3</sup>/ : 27.3...27.5  
 100 s: (27.0...27.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 250.0  
 Rack travel in mm : 5.8...6.2  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.30...1.70  
 2nd speed rpm : 285  
 travel mm : 2.10...2.50  
 3rd speed rpm : 685  
 travel mm : 6.20...6.60  
 4th speed rpm : 1030  
 travel mm : 9.60...10.00  
 5th speed rpm : 1145  
 travel mm : 11.20...11.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 980  
 Aneroid pressure h: 1500  
 Del.quantity : 273.0...275.0  
 1000 : (270.0...278.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1030...1040  
2nd rack travel in: 1.00  
Speed rpm : 1135...1165  
4th rack travel in: 1275  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 320...360

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 400  
Rack travel in m: 12.90...13.10  
2nd speed rpm : 600  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 800  
Rack travel in m: 13.90...14.10  
4th speed rpm : 980  
Rack travel in m: 14.80...15.00

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 980  
Pressure hPa : 1500  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 980

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 760  
Rack travel in m: 13.10...13.20  
3rd pressure hPa : 350  
Rack travel in m: 10.20...10.40

D01

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 231.0...285.0  
1000 s: (278.0...288.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 17,2 e  
 Edition : 18.12.92  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 854  
 Injection pump  
 Pump designation : PE8P130A92C/5LS7822  
 EP type number : 0 412 638 802  
 Governor  
 Governor design. : RQV300...950PA905  
 Governor no. : 0 421 813 723

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.001

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 688 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

D02

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 550  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm<sup>3</sup>/ : 22.1...22.3  
 100 s: (21.8...22.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.8...5.2  
 Del.quantity cm<sup>3</sup>/ : 2.4...3.0  
 100 s: (2.0...3.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.60...1.10  
 2nd speed rpm : 350  
 travel mm : 2.10...2.50  
 3rd speed rpm : 600  
 travel mm : 3.80...4.40  
 4th speed rpm : 950  
 travel mm : 7.20...7.40  
 5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1020  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 550  
 Aneroid pressure h: 900  
 Del.quantity : 221.0...223.0  
 1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 10.40  
Speed rpm : 995...1005  
2nd rack travel in: 4.00  
Speed rpm : 1030...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 380...480

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.60  
2nd pressure hPa : 390  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 330  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 215.0...221.0  
1000 s: (212.0...224.0)  
Aneroid pressure h: -  
Speed rpm : 500

D03

Del. quantity cm<sup>3</sup>/ : 161.0...163.0  
1000 s: (158.0...166.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 995...1005

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 235.0...265.0  
1000 s: (231.0...269.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 899

Injection pump  
 Pump designation : PE8P120A320LS7839-10  
 EP type number : 0 412 628 855  
 Governor  
 Governor design. : RQ300/950PA971-5  
 Governor no. : 0 421 801 559

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 370.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

---

Rack travel in mm : 15.10...15.30

---

Del.quantity cm<sup>3</sup>/ : 26.5...26.7  
 100 s: (26.2...27.0)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 550  
 Aneroid pressure h: 900  
 Del.quantity : 265.0...267.0  
 1000 : (262.0...270.0)

Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1075...1105

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.3

Testing:

Speed rpm : 200

Minimum rack travel: 7.60

Speed rpm : 300

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00

Speed rpm : 370...410

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 400

Pressure hPa : 900

Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 400

1st pressure hPa : 250

Rack travel in m: 10.00...10.20

2nd pressure hPa : 550

Rack travel in m: 12.80...12.90

3rd pressure hPa : 1100

Rack travel in m: 15.20...15.40

4th pressure hPa : 1300

Rack travel in m: 15.60...15.70

5th pressure hPa : -

Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 281.0...284.0

1000 s: (278.0...287.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 80.0...100.0

1000 s: (76.0...104.0)

Rack travel in mm : 9.10...9.50

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 902  
 Injection pump  
 Pump designation : PE8P1Z0A320LS7839-10  
 EP type number : 0 412 628 855  
 Governor  
 Governor design. : RQ300/1050PA972-5  
 Governor no. : 0 421 801 564

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 15.10...15.30

Del. quantity cm<sup>3</sup>/ : 26.5...26.7

100 s: (26.2...27.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 900

Del. quantity : 265.0...267.0

1000 : (262.0...270.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 400  
Pressure hPa : 900  
Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 400  
1st pressure hPa : 250  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 550  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 1100  
Rack travel in m: 15.20...15.40  
4th pressure hPa : 1300  
Rack travel in m: 15.60...15.70  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 1050

Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 283.0...287.0  
1000 s: (280.0...290.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.20  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 9.10...9.50

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 911  
 Injection pump  
 Pump designation : PE8P120A320LS7839-10  
 EP type number : 0 412 628 855  
 Governor  
 Governor design. : RQV300...1050PA797  
 -27  
 Governor no. : 0 421 813 916

Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM442 LA  
 1st version kW : 370.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow quantity min. 1/h: 100...120  
 Test nozzle holder assembly : 1 688 901 105  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1  
 Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550  
 Rack travel in mm : 15.10...15.30  
 Del. quantity cm<sup>3</sup>/ : 26.5...26.7  
 100 s: (26.2...27.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 558  
 travel mm : 4.30...4.80  
 3rd speed rpm : 820  
 travel mm : 5.90...6.40  
 4th speed rpm : 1108  
 travel mm : 8.30...8.80  
 5th speed rpm : 1183  
 travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80



FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550  
Aneroid pressure h: 900  
Del. quantity : 265.0...267.0  
1000 : (262.0...270.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 76...84

Testing:

Speed rpm : 200  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.20  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude

Compensator Test

1st version

Setting  
Speed rpm : 400  
Pressure hPa : 900  
Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 400

1st pressure hPa : 250  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 550

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Rack travel in m: 12.80...12.90  
3rd pressure hPa : 1100  
Rack travel in m: 15.20...15.40  
4th pressure hPa : 1300  
Rack travel in m: 15.60...15.70  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 283.0...287.0  
1000 s: (280.0...290.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 15.20  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 17,2 f  
 Edition : 21.01.93  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 912  
 Injection pump  
 Pump designation : PE8P130A920/5LS7841  
 EP type number : 0 412 638 803  
 Governor  
 Governor design. : RQV300...950PA994K  
 Governor no. : 0 421 815 275

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.050

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 11.50...12.50

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 11.5...12.5  
 Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.4...21.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 300.0

Rack travel in mm : 4.0...4.4

Del. quantity cm<sup>3</sup>/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995

travel mm : 9.60...9.80

2nd speed rpm : 300

travel mm : 2.50...2.70

3rd speed rpm : 500

travel mm : 4.10...4.70

4th speed rpm : 700

travel mm : 5.90...6.50

5th speed rpm : 1250

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 8.10...10.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 900  
Del.quantity : 214.0...216.0  
1000 : (214.0...216.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.40  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

CONSTANT REGULATION  
Speed rpm : 170...290

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 950  
Rack travel in m: 10.40...10.60  
3rd speed rpm : 700  
Rack travel in m: 10.40...10.70  
4th speed rpm : 350  
Rack travel in m: 10.00...10.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 7.30...7.50  
2nd pressure hPa : 360  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 260  
Rack travel in m: 8.10...8.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 214.0...220.0  
1000 s: (214.0...220.0)  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 145.0...155.0  
1000 s: (142.0...158.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 139.0...141.0  
1000 s: (139.0...141.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.00...4.40  
Del.quantity cm<sup>3</sup>/ : 22.0...28.0  
1000 s: (19.0...31.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1

start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 917  
 Injection pump  
 Pump designation : PE8P120A320LS7839-10  
 EP type number : 0 412 628 855  
 Governor  
 Governor design. : RQ300/1050PA993-3  
 Governor no. : 0 421 801 601

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 370.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.10...15.30

Del.quantity cm<sup>3</sup>/ : 26.5...26.7

100 s: (26.2...27.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 265.0...267.0

1000 : (262.0...270.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 400  
Pressure hPa : 900  
Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 400

1st pressure hPa : 250  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 550  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 1100  
Rack travel in m: 15.20...15.40  
4th pressure hPa : 1300  
Rack travel in m: 15.60...15.70  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 283.0...287.0  
1000 s: (280.0...290.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 15.20  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 921  
 Injection pump  
 Pump designation : PE8P120A320LS7839-10  
 EP type number : 0 412 628 855  
 Governor  
 Governor design. : RQ300/950PA993-8  
 Governor no. : 0 421 801 618

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1

Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 15.10...15.30

Del. quantity cm<sup>3</sup>/ : 26.5...26.7

100 s: (26.2...27.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 900

Del. quantity : 265.0...267.0

1000 : (262.0...270.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 400  
Pressure hPa : 900  
Rack travel mm : 15.10...15.30

Measurement

Speed 1/min : 400  
1st pressure hPa : 250  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 550  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 1100  
Rack travel in m: 15.20...15.40  
4th pressure hPa : 1300  
Rack travel in m: 15.60...15.70  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 281.0...284.0  
1000 s: (278.0...287.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 15.30  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 928  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RG300/1050PA1030  
 Governor no. : 0 421 801 640

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.40...13.50  
 Del.quantity cm<sup>3</sup>/ : 23.3...23.5  
 100 s: (23.0...23.8)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 233.0...235.0  
 1000 : (230.0...238.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...13.00  
2nd speed rpm : 800  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 650  
Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 206.0...209.0  
1000 s: (203.0...212.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 45.0...65.0  
1000 s: (41.0...69.0)  
Rack travel in mm : 10.50...10.70

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 930

Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/1050PA1031-2  
 Governor no. : 0 421 801 645

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 233.0...235.0

1000 : (230.0...238.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 650  
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 206.0...209.0  
1000 s: (203.0...212.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)

Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...290.0  
1000 s: (246.0...294.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 932  
 Injection pump  
 Pump designation : PE8P120A320LS7849  
 EP type number : 0 412 628 864  
 Governor  
 Governor design. : RQV300...1050PA1034  
 Governor no. : 0 421 813 993

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 9308 TI

1st version kW : 360.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 3-  
 5- 4

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 15.00...15.10  
 Del. quantity cm<sup>3</sup>/ : 26.2...26.4  
 100 s: (25.9...26.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.1...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.8...2.4  
 100 s: (1.5...2.7)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.10  
 2nd speed rpm : 405  
 travel mm : 2.40...2.90  
 3rd speed rpm : 550  
 travel mm : 4.20...4.60  
 4th speed rpm : 780  
 travel mm : 6.30...6.90  
 5th speed rpm : 1118  
 travel mm : 10.40...10.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 12.70...15.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500

Del.quantity : 262.0...264.0  
1000 : (259.0...267.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

#### Testing:

1st rack travel in: 14.00  
Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 250  
Minimum rack travel: 8.50  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

#### 1st version

#### Setting

Speed rpm : 700  
Pressure hPa : 1500  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 1130  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 870  
Rack travel in m: 12.50...12.70

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 193.5...195.5  
1000 s: (190.5...198.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...175.0  
1000 s: (151.0...179.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 18.0...24.0  
1000 s: (15.0...27.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (10.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE  
 Edition : 18.12.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 932A  
 Injection pump  
 Pump designation : PE8P120A320LS7849  
 EP type number : 0 412 628 864  
 Governor  
 Governor design. : RQV300...1050PA1034  
 Governor no. : 0 421 813 993

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 9308 TI

1st version kW : 360.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 3-  
 5- 4

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 15.00...15.10  
 Del. quantity cm<sup>3</sup>/ : 26.2...26.4  
 100 s: (25.9...26.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.1...5.5  
 Del. quantity cm<sup>3</sup>/ : 1.8...2.4  
 100 s: (1.5...2.7)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.10  
 2nd speed rpm : 405  
 travel mm : 2.40...2.90  
 3rd speed rpm : 550  
 travel mm : 4.20...4.60  
 4th speed rpm : 780  
 travel mm : 6.30...6.90  
 5th speed rpm : 1118  
 travel mm : 10.40...10.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 12.70...15.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1500

Del. quantity : 262.0...264.0  
1000 : (259.0...267.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

#### Testing:

1st rack travel in: 14.00  
Speed rpm : 1100...1110  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 250  
Minimum rack travel: 8.50  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 700  
Pressure hPa : 1500  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 1130  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 870  
Rack travel in m: 12.50...12.70

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm3/ : 193.5...195.5  
1000 s: (190.5...198.5)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1100...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 155.0...175.0  
1000 s: (151.0...179.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.50  
Del. quantity cm3/ : 18.0...24.0  
1000 s: (15.0...27.0)  
Spread cm3 : 6.00  
1000 s: (10.00)

Remarks:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 31.08.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 939  
 Injection pump  
 Pump designation : PE8P12GA320LS7851  
 EP type number : 0 412 628 865  
 Governor  
 Governor design. : RQV300...1050PA797  
 -37  
 Governor no. : 0 421 814 003

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 405.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80  
 : (4.65...4.85)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.40...14.60

Del. quantity cm<sup>3</sup>/ : 28.1...28.3

100 s: (27.8...28.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.50...1.00

2nd speed rpm : 575  
 travel mm : 4.30...4.80

3rd speed rpm : 830  
 travel mm : 5.90...6.40

4th speed rpm : 1108  
 travel mm : 8.10...8.60

5th speed rpm : 1190  
 travel mm : 9.70...10.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.10...14.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 1300  
Del. quantity : 281.0...283.0  
1000 : (278.0...286.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 13.40  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 14.40...14.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.90...8.10  
2nd pressure hPa : 500  
Rack travel in m: 9.20...9.40  
3rd pressure hPa : 1000  
Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 292.5...296.5  
1000 s: (289.5...299.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 80.0...100.0  
1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 939  
 Injection pump  
 Pump designation : PE8P120A320LS7863-1  
 EP type number : 0 412 628 876  
 Governor  
 Governor design. : RQV300...1050PA797  
 -37  
 Governor no. : 0 421 814 003

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 405.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80  
 : (4.65...4.85)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.40...14.60

Del. quantity cm<sup>3</sup>/ : 28.1...28.3

100 s: (27.8...28.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.50...1.00

2nd speed rpm : 575  
 travel mm : 4.30...4.80

3rd speed rpm : 830  
 travel mm : 5.90...6.40

4th speed rpm : 1108  
 travel mm : 8.10...8.60

5th speed rpm : 1190  
 travel mm : 9.70...10.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.10...14.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 1300  
Del.quantity : 281.0...283.0  
1000 : (278.0...286.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 13.40  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 78...86

Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 14.40...14.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.90...8.10  
2nd pressure hPa : 500  
Rack travel in m: 9.20...9.40  
3rd pressure hPa : 1000  
Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 600  
Del.quantity cm3/ : 292.5...296.5  
1000 s: (289.5...299.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...100.0  
1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 940  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/950PA1032-4  
 Governor no. : 0 421 801 661

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA  
 1st version kW : 280.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1  
 Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.30...13.40  
 Del. quantity cm<sup>3</sup>/ : 22.8...23.0  
 100 s: (22.5...23.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1200  
 Del. quantity : 228.0...230.0  
 1000 : (225.0...233.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.00  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 12.90...13.10  
2nd speed rpm : 600  
Rack travel in m: 13.30...13.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.70

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 650  
Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del.quantity cm3/ : 214.0...218.0  
1000 s: (211.0...221.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 45.0...75.0  
1000 s: (41.0...79.0)  
Rack travel in mm : 10.40...10.80

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 941  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQV300...950PA1033-7  
 Governor no. : 0 421 814 019

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 95...115

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1  
 Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.30...13.40  
 Del. quantity cm<sup>3</sup>/ : 22.8...23.0  
 100 s: (22.5...23.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.50  
 2nd speed rpm : 567  
 travel mm : 4.40...5.00  
 3rd speed rpm : 780  
 travel mm : 6.00...6.60  
 4th speed rpm : 1010  
 travel mm : 8.50...8.70  
 5th speed rpm : 1190  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1050  
 Rack travel in mm : 10.70...13.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1200  
Del. quantity : 228.0...230.0  
1000 : (225.0...233.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 300...390

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 850  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 300

E04

Rack travel in m: 11.00...11.10  
2nd pressure hPa : 650  
Rack travel in m: 12.50...12.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 214.0...218.0  
1000 s: (211.0...221.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 12.00  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 08.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 942

Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/950PA1031-6  
 Governor no. : 0 421 801 662

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

---

Rack travel in mm : 13.30...13.40

---

Del. quantity cm<sup>3</sup>/ : 22.8...23.0  
 100 s: (22.5...23.3)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1200  
 Del. quantity : 228.0...230.0  
 1000 : (225.0...233.0)

Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.00

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1050...1080

4th rack travel in: 1350

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

Testing:

Speed rpm : 200

Minimum rack travel: 8.80

Speed rpm : 300

Rack travel in mm : 5.40...5.60

Rack travel in mm : 2.00

Speed rpm : 390...430

TORQUE CONTROL

Dimension a mm : 0.35

Torque control curve - 1st version

1st speed rpm : 950

Rack travel in m: 13.00...13.10

2nd speed rpm : 600

Rack travel in m: 13.30...13.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.40...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : 300

Rack travel in m: 11.00...11.10

2nd pressure hPa : 650

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950

Del. quantity cm<sup>3</sup>/ : 214.0...218.0

1000 s: (211.0...221.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 134.0...136.0

1000 s: (131.0...139.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 990...1005

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 945  
 Injection pump  
 Pump designation : PE8P120A32OLS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : R0300/1050PA1030-6  
 Governor no. : 0 421 801 666

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1200

Del. quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 355...395

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 1050  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 650  
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 210.0...214.0  
1000 s: (207.0...217.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 45.0...75.0  
1000 s: (41.0...79.0)  
Rack travel in mm : 9.90...10.30

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB  
 Edition : 11.C1.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 648 946  
  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/1050PA1031-7  
 Governor no. : 0 421 801 667

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1200

Del. quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 1050  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 650  
Rack travel in m: 12.20...12.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 210.0...214.0  
1000 s: (207.0...217.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 21.01.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 950  
 Injection pump  
 Pump designation : PE8P120A320LS7860  
 EP type number : 0 412 628 870  
 Governor  
 Governor design. : RQV350...1050PA1052  
 Governor no. : 0 421 814 037

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...110

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.1...4.7

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.00...1.50

2nd speed rpm : 403  
 travel mm : 1.70...2.20

3rd speed rpm : 453  
 travel mm : 2.30...2.80

4th speed rpm : 770  
 travel mm : 4.70...5.20

5th speed rpm : 1108  
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 . Degree: -1

Speed rpm : 1185  
 Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1200  
Del. quantity : 233.0...235.0  
1000 : (230.0...238.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 380...450

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 1050  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 900  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...10.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 350

Rack travel in m: 10.40...10.50  
2nd pressure hPa : 750  
Rack travel in m: 12.10...12.30

#### START CUT-OFF

Speed 1/min : 270 (280)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 154.0...158.0 \*  
1000 s: (151.0...161.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* = Set at reduced-delivery stop.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 953  
 Injection pump  
 Pump designation : PE8P120A320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQV300...950PA1033  
 -10  
 Governor no. : 0 421 814 040

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1  
 Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550  
 Rack travel in mm : 13.60...13.70  
 Del.quantity cm<sup>3</sup>/ : 24.1...24.3  
 100 s: (23.8...24.6)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 567  
 travel mm : 4.40...4.90  
 3rd speed rpm : 617  
 travel mm : 5.00...5.50  
 4th speed rpm : 780  
 travel mm : 6.10...6.60  
 5th speed rpm : 1009  
 travel mm : 8.30...8.80

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1050  
 Rack travel in mm : 11.30...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550  
Aneroid pressure h: 1000  
Del. quantity : 241.0...243.0  
1000 : (238.0...246.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 12.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 550  
Rack travel in m: 12.30...12.50

START CUT-OUT

Speed 1/min : 220 (240)

E14

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 990.. 1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 955  
 Injection pump  
 Pump designation : PE8P120A320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQ300/950PA1031-9  
 Governor no. : 0 421 801 675

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 24.1...24.3

100 s : (23.8...24.6)

Spread cm<sup>3</sup> : 0.6

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s : (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1000

Del. quantity : 241.0...243.0

1000 : (238.0...246.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.60  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 550  
Rack travel in m: 12.20...12.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

E16

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 990...1005

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...95.0  
1000 s: (61.0...99.0)  
Rack travel in mm : 9.40...9.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 h1  
 Edition : 18.12.92  
 Replaces : 06.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 813  
 Injection pump  
 Pump designation : PE10P120A520LS7825-1  
 EP type number : 0 412 629 809  
 Governor  
 Governor design. : RQV250...1150PA902-3  
 Governor no. : 0 421 813 761

Customer-spec. information  
 Customer : MAN

Engine : D 2840 LXE

1st version kw : 603.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 10- 9- 4- 1- 8- 7-  
 : 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 : 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.30...13.40  
 Del.quantity cm<sup>3</sup>/ : 29.4...29.6  
 100 s: (29.1...29.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 8.8...9.0  
 Del.quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s: (14.6...15.4)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)  
 3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm<sup>3</sup>/ : 5.2...6.0 \*\*  
 100 s: (-)  
 Spread cm<sup>3</sup> : -  
 100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 250  
 travel mm : 0.90...1.10  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.50...5.90  
 4th speed rpm : 1150  
 travel mm : 9.20...9.40  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1280

Rack travel in mm : 11.00...13.60

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 294.0...296.0  
1000 : (291.0...299.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 118...126

##### Testing:

1st rack travel in: 12.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 76...84

##### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 100  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 470  
Rack travel in m: 12.00...12.40

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0\*\*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 0 \*  
1000 s: (-)  
Rack travel in mm : 17.5...21.0

#### HIGH IDLE

##### 1st version

Speed rpm : 500  
Rack travel in mm : 0.00...7.00  
Del.quantity cm<sup>3</sup>/ : 0 \*  
1000 s: (-)

##### 2nd version

Speed rpm : 500  
Rack travel in mm : 0.00...7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

##### 3rd version

Speed rpm : 500  
Rack travel in mm : 8.10...8.30  
Del.quantity cm<sup>3</sup>/ : 125.0...  
1000 s: (-)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*\*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7151

\* applies to cylinders 1, 2, 3, 7 and 9  
\*\* applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 814  
 Injection pump  
 Pump designation : PE10P120A520LS7831  
 EP type number : 0 412 629 806  
 Governor  
 Governor design. : RQ300/950PA950-1  
 Governor no. : 0 421 801 651

Customer-spec. information  
 Customer : MAN

Engine : D 2840 LF 06  
 1st version kW : 368.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000  
 (A) Injection pump settings values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 13.00...14.00  
 Firing order : 10- 9- 4- 1- 8- 7-  
 : 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 : 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 950  
 Rack travel in mm : 13.30...13.40  
 Del. quantity cm<sup>3</sup>/ : 22.3...22.5  
 100 s: (22.0...22.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 950  
 Aeroid pressure h: 1000  
 Del. quantity : 223.0...225.0  
 1000 : (220.0...228.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:



1st rack travel in: 12.30  
Speed rpm : 995...1010  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.60  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 600  
Rack travel in m: 13.30...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 430  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 700  
Rack travel in m: 12.00...12.40

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 219.0...225.0  
1000 s: (216.0...228.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 995...1010

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.30  
Del.quantity cm<sup>3</sup>/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7222

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 10  
start of delivery

#### APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 678 821

Injection pump  
 Pump designation : PE8P120A320LS7860-1  
 EP type number : 0 412 628 871  
 Governor  
 Governor design. : RSV350...1050POA535  
 -11  
 Governor no. : 0 421 833 391

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 402 LA

1st version kW : 280.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.80...12.90

Del. quantity cm<sup>3</sup>/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...5.3

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del. quantity : 206.0...208.0

1000 : (203.0...211.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1150...1168  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE ?  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 375...435

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 900  
Rack travel in m: 13.20...13.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 750  
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 822  
 Injection pump  
 Pump designation : PE8P120A320LS7840-2  
 EP type number : 0 412 628 873  
 Governor  
 Governor design. : RSV350...1050POA535  
 -10  
 Governor no. : 0 421 833 395

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 442 A

1st version kW : 250.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del.quantity : 193.0...195.0

1000 : (190.0...198.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1150...1168  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 385...445

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 700  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 900  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.90...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 700  
Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 208.0...212.0  
1000 s: (205.0...215.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 735 805  
 Injection pump  
 Pump designation : PES5P120A720/3LS7250  
 EP type number : 0 412 725 809  
 Governor  
 Governor design. : RQV325...1000PA962-6  
 K  
 Governor no. : 0 421 815 301

Customer-spec. information  
 Customer : MAN

Engine : D2865LF06/LU06  
 1st version kW : 235.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 12.40...12.50  
 Del. quantity cm<sup>3</sup>/ : 26.0...26.2  
 100 s: (25.7...26.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.8...5.2  
 Del. quantity cm<sup>3</sup>/ : 4.7...5.3  
 100 s: (4.4...5.6)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1050  
 travel mm : 8.70...8.90  
 2nd speed rpm : 325  
 travel mm : 2.40...2.60  
 3rd speed rpm : 520  
 travel mm : 4.20...4.80  
 4th speed rpm : 810  
 travel mm : 6.00...6.40  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1180

Rack travel in mm : 9.20...13.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 260.0...262.0  
1000 : (257.0...265.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 288...296

Testing:

1st rack travel in: 11.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 242...250

Testing:

Speed rpm : 250  
Minimum rack travel: 6.50  
Speed rpm : 350  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 340...450

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 1000  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 650  
Rack travel in m: 12.00...12.20  
4th speed rpm : 400  
Rack travel in m: 11.10...11.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 12.40...12.50

E27

Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.30...8.50  
2nd pressure hPa : 170  
Rack travel in m: 8.70...8.80  
3rd pressure hPa : 600  
Rack travel in m: 11.30...11.60

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 243.0...249.0  
1000 s: (240.0...252.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 270.0...276.0  
1000 s: (267.0...279.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

: MAN-NR. 3-7202

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 5  
start of delivery





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 10,0 f  
 Edition : 18.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 735 806  
 Injection pump  
 Pump designation : PES5P120A720/3LS7250  
 EP type number : 0 412 725 809  
 Governor  
 Governor design. : RQV325...1000PA960  
 -8K  
 Governor no. : 0 421 815 308

Customer-spec. information  
 Customer : MAN

Engine : D2865LF03  
 1st version kW : 235.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

F01

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 650  
 Rack travel in mm : 11.80...11.90  
 Del. quantity cm<sup>3</sup>/ : 26.6...26.8  
 100 s : (26.3...27.1)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.2  
 Del. quantity cm<sup>3</sup>/ : 4.7...5.3  
 100 s : (4.4...5.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1055  
 travel mm : 10.40...10.60  
 2nd speed rpm : 325  
 travel mm : 2.40...2.60  
 3rd speed rpm : 500  
 travel mm : 3.40...4.00  
 4th speed rpm : 750  
 travel mm : 6.80...7.20  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 9.10...13.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 650

Aneroid pressure h: 1200  
Del. quantity : 266.0...268.0  
1000 : (263.0...271.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 293...301

#### Testing:

1st rack travel in: 11.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 248...256

#### Testing:

Speed rpm : 225  
Minimum rack travel: 6.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 340...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 650  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 1000  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 900  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.50

#### Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 170  
Rack travel in m: 8.60...8.70

F02

3rd pressure hPa : 600  
Rack travel in m: 11.30...11.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 245.0...251.0  
1000 s: (242.0...254.0)  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 260.0...266.0  
1000 s: (257.0...269.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.20  
Del. quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7201

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 5  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 w  
 Edition : 11.01.93  
 Replaces : 05.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 806  
 Injection pump  
 Pump designation : PES6P110A12ORS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964K  
 Governor no. : 0 421 815 252

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kw : 171.5  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 15.80...15.90

Del.quantity cm<sup>3</sup>/ : 16.8...17.0

100 s: (16.5...17.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.60...1.80

2nd speed rpm : 600

travel mm : 2.80...3.30

3rd speed rpm : 1300

travel mm : 7.20...7.40

4th speed rpm : 1500

travel mm : 8.90...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1500

Del.quantity : 168.5...170.5

1000 : (165.5...173.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 14.80  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 275  
Minimum rack trave: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 825  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 700  
Rack travel in m: 14.00...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1500  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 400  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 930  
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 300 (310)

F04

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 825  
Del.quantity cm3/ : 178.0...184.0  
1000 s: (175.0...187.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 87.0...91.0  
1000 s: (85.0...93.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.80  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.40...13.40

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3921769

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 2  
 Edition : 08.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 816  
 Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964  
 -8K  
 Governor no. : 0 421 815 264

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del. quantity cm<sup>3</sup>/ : 19.1...19.3

100 s: (18.8...19.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del. quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

travel mm : 9.00...9.20

5th speed rpm : 1400

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del. quantity : 191.5...193.5

1000 : (188.5...196.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 12.60...13.00  
3rd speed rpm : 1200  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 335  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 785  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 183.5...189.5  
1000 s: (180.5...192.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : C.D.C. # 3921770

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 05.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 823  
 Injection pump  
 Pump designation : PES6P110A12ORS7249  
 EP type number : 0 412 716 807  
 Governor  
 Governor design. : RQV350...1150PA964  
 -9K  
 Governor no. : 0 421 815 295

Customer-spec. information  
 Customer : CDC

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

F07

BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
 Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del. quantity cm<sup>3</sup>/ : 17.8...18.0

100 s: (17.5...18.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.10

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 1200  
 Del. quantity : 178.0...180.0  
 1000 : (175.0...183.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 61...69

Testing:

1st rack travel in: 13.30  
Speed rpm : 1195...1205  
2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:

Speed rpm : 275  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.30...14.40

Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 7.90...8.30  
2nd pressure hPa : 320  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 860  
Rack travel in m: 13.20...13.60

START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 165.0...171.0  
1000 s: (162.0...174.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 83.5...87.5  
1000 s: (81.5...89.5)

#### BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1195...1205

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.90...11.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 23.5...29.5  
1000 s: (21.5...31.5)  
Spread cm3 : 7.00  
1000 s: (11.00)

Remarks:

: C.D.C. # 3921970

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 22.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 829  
 Injection pump  
 Pump designation : PES6P120A12ORS7261  
 EP type number : 0 412 726 876  
 Governor  
 Governor design. : RQV350...1100PA924  
 -7K  
 Governor no. : 0 421 815 317

Customer-spec. information  
 Customer : CUMMINS

Engine : 6CTAA

1st version kW : 202.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ' : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.5...17.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.10...1.50

2nd speed rpm : 550  
 travel mm : 3.40...4.00

3rd speed rpm : 900  
 travel mm : 6.10...6.70

4th speed rpm : 1150  
 travel mm : 8.40...8.60

5th speed rpm : 1250  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del. quantity : 165.0...167.0  
1000 : (165.0...173.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

#### Testing:

1st rack travel in: 11.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74

#### Testing:

Speed rpm : 250  
Minimum rack travel: 6.30  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 350...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 700  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 900  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500  
Rack travel in m: 10.40...10.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 12.00...12.10

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.40...7.60  
2nd pressure hPa : 700

F10

Rack travel in m: 11.10...11.20  
3rd pressure hPa : 320  
Rack travel in m: 8.20...8.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del. quantity cm3/ : 181.0...187.0  
1000 s: (178.0...190.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 105.0...109.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 250.0...280.0  
1000 s: (246.0...284.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Del. quantity cm3/ : 23.0...29.0  
1000 s: (21.0...31.0)  
Spread cm3 : 7.00  
1000 s: (11.00)

#### Remarks:

: C.D.C # 3281842

Start-of-delivery mark is at 7° after  
start of delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 h  
 Edition : 18.12.92  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 883  
 Injection pump  
 Pump designation : PES6P110A32ORS7198  
 EP type number : 0 412 716 802  
 Governor  
 Governor design. : RQV275...1250PA942K  
 Governor no. : 0 421 815 234

Customer-spec. information  
 Customer : RVI

Engine : MIDRO6-06-26

1st version kw : 132.5  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.53...4.63  
 : (4.48...4.68)  
 Rack travel in mm : 12.50...13.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.60...14.70  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...4.00

BASIC SETTING

1st speed rpm : 1250  


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 Rack travel in mm : 14.60...14.70  


---

 Del.quantity cm<sup>3</sup>/ : 15.7...15.9  
 100 s : (15.4...16.1)  


---

 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 275.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.2  
 100 s : (1.4...2.4)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300  
 travel mm : 9.50...9.70  
 2nd speed rpm : 275  
 travel mm : 0.90...1.10  
 3rd speed rpm : 550  
 travel mm : 3.80...4.20  
 4th speed rpm : 1000  
 travel mm : 7.10...7.50  
 5th speed rpm : 1600  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1385  
 Rack travel in mm : 12.30...14.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1000  
Del. quantity : 157.0...159.0  
1000 : (154.5...161.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 275  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 350...480

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 750  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 300  
Rack travel in m: 12.39...13.30

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.70

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 11.00...11.40

2nd pressure hPa : 360  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 220  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (122.0...132.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 67.0...69.0  
1000 s: (64.5...71.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 85.0...115.0  
1000 s: (81.0...119.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.30  
Del. quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 i  
 Edition : 18.12.92  
 Replaces : 04.92  
 Test oil : ISO-4113

Combination no. : 0 402 746 894

Injection pump  
 Pump designation : PES6P110A320RS7208  
 EP type number : 0 412 716 803  
 Governor  
 Governor design. : RQV275...1175PA942  
 -1K

Governer no. : 0 421 815 244

Customer-spec. information  
 Customer : RVI

Engine : MIDRO60226 M

1st version kW : 210.0  
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.03...4.13  
 : (3.98...4.18)

Rack travel in mm : 13.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.75...4.25

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 17.0...17.2

100 s: (16.7...17.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 9.10...9.20

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 550

travel mm : 3.80...4.20

4th speed rpm : 1000

travel mm : 7.00...7.40

5th speed rpm : 1600

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1175  
Aneroid pressure h : 1000  
Del. quantity : 170.0...172.0  
1000 : (167.5...174.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 56...64

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.80  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 350...480

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 700  
Rack travel in m: 13.25...13.45  
3rd speed rpm : 800  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1175  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 1175

1st pressure hPa : -

Rack travel in m: 10.40...11.00  
2nd pressure hPa : 520  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 240  
Rack travel in m: 11.10...11.50

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 148.0...154.0  
1000 s: (145.0...157.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (71.5...78.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 90.0...120.0  
1000 s: (86.0...124.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -8.50...-9.10  
Del. quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,8 L1  
 Edition : 05.02.93  
 Replaces : 11,91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 898  
 Injection pump  
 Pump designation : PES6P120A32ORS7215  
 EP type number : 0 412 726 838  
 Governor  
 Governor design. : RQV250...1000PA967  
 Governor no. : 0 421 813 876

Customer-spec. information

Customer : ENASA

Engine : 96 R1 FX

1st version kW : 294.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 28.8...29.0

100 s: (28.5...29.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.7...6.1

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.40

2nd speed rpm : 350  
 travel mm : 2.10...2.60

3rd speed rpm : 700  
 travel mm : 4.70...5.30

4th speed rpm : 1055  
 travel mm : 7.90...8.10

5th speed rpm : 1145  
 travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del. quantity : 288.0...290.0  
1000 : (285.0...293.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 12.00  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 73...81

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.00  
Speed rpm : 250  
Rack travel in mm : 3.30...3.70

#### CONSTANT REGULATION

Speed rpm : 250...320

Aneroid/Altitude  
Compensator Test

#### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 710  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 350  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

F16

Aneroid pressure h: 1200  
Speed rpm : 900  
Del. quantity cm3/ : 279.0...283.0  
1000 s: (276.0...286.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 146.0...149.0  
1000 s: (143.0...152.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.30...3.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 9,5 i 1  
 Edition : 21.01.93  
 Replaces : 06.92  
 Test oil : ISO-4113

Combination no. : 0 402 746 902

Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : 0 412 726 340  
 Governor  
 Governor design. : RQV275...1100PA975  
 -1K  
 Governor no. : 0 421 815 267

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.320

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.1...5.5

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (2.9...4.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.30...10.50

2nd speed rpm : 275  
 travel mm : 1.30...1.50

3rd speed rpm : 450  
 travel mm : 3.40...4.00

4th speed rpm : 750  
 travel mm : 5.90...6.30

5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 275  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 270...400

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 700  
Rack travel in m: 9.90...10.10  
3rd speed rpm : 900  
Rack travel in m: 10.70...10.90  
4th speed rpm : 400  
Rack travel in m: 9.30...9.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 11.20...11.30

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.70...7.90  
2nd pressure hPa : 600  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 420

Pack travel in m: 9.10...9.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 188.0...194.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.10...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (29.0...41.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 746 919X

Injection pump  
 Pump designation : PES6P120A720LS7237  
 -10

EP type number : 0 412 726 872  
 Governor  
 Governor design. : RQ300/1100PA1013-1  
 Governor no. : 0 421 801 603

Cust. part no. : 0220743402

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.90

Del.quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 1145...1150  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.40...12.50  
2nd pressure hPa : 950  
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 205.0...209.0  
1000 s: (202.0...212.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -

F20

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 l  
 Edition : 11.01.93  
 Replaces : 03.92  
 Test oil : ISO-4113

Combination no. : 0 402 746 924

Injection pump  
 Pump designation : PES6P110A32ORS7243  
 EP type number : 0 412 716 806  
 Governor  
 Governor design. : RQV275...1250PA942  
 -2K  
 Governor no. : 0 421 815 288

Customer-spec. information  
 Customer : RVI

Engine : MIDR06-06-26 L/2

1st version kW : 132.5  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

F21

Prestroke mm : 4.85...4.95  
 : (4.80...5.00)  
 Rack travel in mm : 13.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 13.00...0.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 1.00...2.25

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 14.0...14.2

100 s: (13.7...14.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 7.4...7.8

Del. quantity cm<sup>3</sup>/ : 2.4...2.8

100 s: (2.4...2.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320  
 travel mm : 9.70...9.90

2nd speed rpm : 275  
 travel mm : 0.90...1.10

3rd speed rpm : 600  
 travel mm : 4.20...4.60

4th speed rpm : 1000  
 travel mm : 7.00...7.40

5th speed rpm : 1600  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1450

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250  
Aneroid pressure h : 1000  
Del. quantity : 140.0...142.0  
1000 : (137.5...144.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

RATED SPEED

1st version

Control lever  
position degrees: 272...280

Testing:

1st rack travel in: 12.00  
Speed rpm : 1320...1330  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 218...226

Testing:

Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 275  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 350...480

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 650  
Rack travel in m: 12.00...12.10  
3rd speed rpm : 300  
Rack travel in m: 11.20...11.60

Aneroid/Altitude

Compensator Test

1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 13.00...13.10

Measurement

F22

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.10...10.50  
2nd pressure hPa : 280  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 180  
Rack travel in m: 10.60...11.00

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 124.5...128.5  
1000 s: (124.5...128.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.5...83.5)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...130.0  
1000 s: (96.0...134.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.20...5.60  
Del. quantity cm<sup>3</sup>/ : 24.0...28.0  
1000 s: (24.0...28.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 l 1  
 Edition : 11.01.93  
 Replaces : 03.92  
 Test oil : ISO-4113

Combination no. : 0 402 746 928

Injection pump  
 Pump designation : PES6F110A32DRS7243  
 EP type number : 0 412 716 806  
 Governor  
 Governor design. : RQV275...1175PA942  
 -3K  
 Governor no. : 0 421 815 294

Customer-spec. information  
 Customer : RVI

Engine : MIDR06-06-26 M/2

1st version kW : 132.5  
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

F23

Prestroke mm : 4.85...4.95  
 : (4.80...5.00)  
 Rack travel in mm : 13.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 13.40...13.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 1.00...2.25

BASIC SETTING

1st speed rpm : 1175

---

Rack travel in mm : 13.40...13.50

---

Del.quantity cm<sup>3</sup>/ : 15.2...15.4  
 100 s: (14.9...15.6)

---

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.3...2.7  
 100 s: (2.3...2.7)

---

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
 travel mm : 9.10...9.30  
 2nd speed rpm : 275  
 travel mm : 0.90...1.10  
 3rd speed rpm : 600  
 travel mm : 4.20...4.60  
 4th speed rpm : 1000  
 travel mm : 7.00...7.40  
 5th speed rpm : 1600  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1450

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175  
Aneroid pressure h : 1000  
Del. quantity : 152.0...154.0  
1000 : (149.5...156.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

RATED SPEED

1st version

Control lever  
position degrees: 290...298

Testing:

1st rack travel in: 12.40  
Speed rpm : 1255...1265  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 238...246

Testing:

Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 275  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

Speed rpm : 350...480

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 700  
Rack travel in m: 12.55...12.75  
3rd speed rpm : 300  
Rack travel in m: 11.70...12.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1175  
Pressure hPa : 1000  
Rack travel mm : 13.40...13.50

Measurement

F24

Speed 1/min : 1175

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 420  
Rack travel in m: 11.65...11.75  
3rd pressure hPa : 240  
Rack travel in m: 10.60...10.80

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 149.0...153.0  
1000 s: (146.0...156.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.5...83.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1255...1265

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...130.0  
1000 s: (96.0...134.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.30  
Del. quantity cm<sup>3</sup>/ : 23.0...27.0  
1000 s: (23.0...27.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 110A  
 Injection pump  
 Pump designation : PES4MW100/72ORS1127  
 EP type number : 0 413 404 103  
 Governor  
 Governor design. : RQV300...1300MW48-1  
 Governor no. : 0 420 083 084

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 364 LA

1st version kW : 85.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.70...10.80  
 Del. quantity cm<sup>3</sup>/ : 8.0...8.2  
 100 s : (7.8...8.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.8...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340  
 travel mm : 8.50...8.70  
 2nd speed rpm : 1450  
 travel mm : 9.50...9.90  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del. quantity : 80.0...82.0  
 1000 : (78.0...84.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.80...6.90

CONSTANT REGULATION  
Speed rpm : 320...550

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 1175  
Rack travel in m: 11.00...11.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.00...11.20  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

F26

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 75.5...78.5  
1000 s: (73.0...81.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.80...6.90  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 8,1 D  
 Edition : 21.08.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 249  
 Injection pump  
 Pump designation : PES6MW100/72ORS1197  
 EP type number : 0 413 406 185  
 Governor  
 Governor design. : RQV325...1350MW109K  
 Governor no. : 0 420 083 997

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8060.45.6000  
 1st version kw : 169.0  
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1350  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s: (9.9...10.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.7...7.9  
 Del.quantity cm<sup>3</sup>/ : 2.5...2.9  
 100 s: (2.2...3.1)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
 travel mm : 10.00...10.40  
 2nd speed rpm : 825  
 travel mm : 4.90...5.10  
 3rd speed rpm : 400  
 travel mm : 2.90...3.50  
 4th speed rpm : 325  
 travel mm : 1.50...1.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1350  
 Aneroid pressure h: 850  
 Del.quantity : 101.0...103.0  
 1000 : (99.0...105.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 117...125

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1420...1430  
2nd rack travel in: 4.00  
Speed rpm : 1520...1550  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.8

#### Testing:

Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 325  
Rack travel in mm : 7.70...7.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1200  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 1000  
Rack travel in m: 13.20...13.50  
4th speed rpm : 700  
Rack travel in m: 13.30...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.20...11.30

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 350  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 550  
Rack travel in m: 12.80...13.10  
3rd pressure hPa : 850  
Rack travel in m: 13.30...13.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 850  
Speed rpm : 1200

Del. quantity cm<sup>3</sup>/ : 100.5...103.5  
1000 s: (98.0...106.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (77.0...83.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1420...1430

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 55.0...75.0  
1000 s: (52.0...78.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.70...7.90  
Del. quantity cm<sup>3</sup>/ : 25.0...29.0  
1000 s: (22.5...31.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

\* Adjusting starting fuel delivery  
(0 403 446 249)

#### 1. Cold start

- Loosen adjusting screw for lug cam
- Fully screw in TAS
- Set engine speed 100 1/min
- Screw in adjusting screw until control-rod travel jumps from 13.4 mm to 21 mm; in doing so, constantly move control lever back and forth from idle to full-load position
- Lock adjusting screw
- Screw in cap for limiting starting fuel delivery. Delivery rate 95...115 ccm/1000 strokes

#### 2. Warm start

- Set engine speed 265...275 1/min
- Screw out TAS until control-rod travel jumps from 11.2 mm to

13.4 mm. In doing so, constantly  
move control lever back and forth  
from idle to full-load position.

Lock TAS

- Set engine speed 100 1/min,  
control lever in full-load  
position. Control-rod travel must  
not exceed 13.4 mm.
- Delivery rate 55...75 ccm/1000  
strokes



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 290  
 Injection pump  
 Pump designation : PES6MW100/320RS1224  
 EP type number : 0 413 406 210  
 Governor  
 Governor design. : RGV350...1100MW120K  
 Governor no. : 0 420 083 993

Customer-spec. information  
 Customer : VME

Engine : TD 61 KBE

1st version kW : 115.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00

G02

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.20...14.30

Del.quantity cm<sup>3</sup>/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.0

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1150

travel mm : 9.80...10.20

2nd speed rpm : 850

travel mm : 6.90...7.10

3rd speed rpm : 550

travel mm : 3.50...4.10

4th speed rpm : 350

travel mm : 1.00...1.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1500

Del.quantity : 124.0...126.0

1000 : (122.0...128.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 118...126

Testing:

1st rack travel in: 13.20

Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1255...1285  
4th rack travel in: 1350  
Speed rpm : 0.10...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 830  
Rack travel in m: 14.90...15.00  
3rd speed rpm : 735  
Rack travel in m: 14.50...14.70  
4th speed rpm : 600  
Rack travel in m: 13.20...13.60  
5th speed rpm : 970  
Rack travel in m: 14.40...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 830  
Pressure hPa : 250  
Rack travel mm : 11.30...11.40

#### Measurement

Speed 1/min : 830

1st pressure hPa : 1500  
Rack travel in m: 14.90...15.00  
2nd pressure hPa : -  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 660  
Rack travel in m: 14.50...14.70

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 830  
Del.quantity cm<sup>3</sup>/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF  
 Edition : 21.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 310  
 Injection pump  
 Pump designation : PES6MW100/320RS1227Z  
 EP type number : 0 413 406 217  
 Governor  
 Governor design. : RQV325...1300MW126  
 Governor no. : 0 420 083 219

Cust. part no. : 1249952

Customer-spec. information  
 Customer : DAF

Engine : NS133L

1st version kw : 133.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 13.50...0.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.60...11.70

Del. quantity cm<sup>3</sup>/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.4...4.6

Del. quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 8.40...8.80

2nd speed rpm : 875  
 travel mm : 4.90...5.10

3rd speed rpm : 500  
 travel mm : 2.70...3.30

4th speed rpm : 325  
 travel mm : 1.50...1.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del. quantity : 90.0...92.0  
 1000 : (88.0...94.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version



Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 290  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 160  
Rack travel in m: 10.30...10.60  
3rd pressure hPa : -  
Rack travel in m: 9.90...10.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 89.5...92.5  
1000 s: (87.0...95.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 62.0...64.0  
1000 s: (60.0...66.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1330...1340

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 22.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 311  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW50-28  
 Governor no. : 0 420 083 281

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 155.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del. quantity cm<sup>3</sup>/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del. quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel : 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 200  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 350  
Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm3/ : 87.0...91.0  
1000 s: (85.0...93.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 22.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 312  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW50-29  
 Governor no. : 0 420 083 282

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kw : 155.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 13.10...13.20  
 Del. quantity cm<sup>3</sup>/ : 9.8...10.0  
 100 s : (9.6...10.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...10.00  
 2nd speed rpm : 1350  
 travel mm : 8.50...8.70  
 3rd speed rpm : 500  
 travel mm : 2.70...3.30  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del. quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Setting point:  
Speed rpm : 1350  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 200  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 350  
Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 87.0...91.0  
1000 s: (85.0...93.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA  
 Edition : 25.09.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 313  
 Injection pump  
 Pump designation : PES6MW100/720RS1228  
 EP type number : 0 413 406 213  
 Governor  
 Governor design. : RQV325...1350MW127K  
 Governor no. : 0 420 083 988

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8060.45.6200

1st version kW : 167.0  
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 11.5...11.7  
 100 s : (11.3...11.9)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 6.5...6.7  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s : (1.7...2.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
 travel mm : 10.00...10.40  
 2nd speed rpm : 825  
 travel mm : 4.90...5.10  
 3rd speed rpm : 400  
 travel mm : 2.90...3.50  
 4th speed rpm : 325  
 travel mm : 1.50...1.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del. quantity : 115.5...117.5  
 1000 : (113.5...119.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 120...128

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1420...1430  
2nd rack travel in: 4.00  
Speed rpm : 1515...1545  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 1200  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 900  
Rack travel in m: 12.60...12.80  
4th speed rpm : 1350  
Rack travel in m: 13.10...13.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1200  
Pressure hPa : -  
Rack travel mm : 8.90...9.10

#### Measurement

Speed 1/min : 1200  
1st pressure hPa : 450  
Rack travel in m: 10.50...10.60  
2nd pressure hPa : 800  
Rack travel in m: 12.50...12.80  
3rd pressure hPa : 1200  
Rack travel in m: 13.40...13.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1200

Del.quantity cm<sup>3</sup>/ : 120.0...123.0  
1000 s: (117.5...125.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 71.0...73.0  
1000 s: (69.0...75.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1420...1430

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 40.0...60.0  
1000 s: (37.0...63.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

\* Adjusting starting fuel delivery  
(0 403 446 313)

#### 1. Pre-setting

- Loosen adjusting screw for lug cam
- TAS pre-setting dimension:  
59.8...66.2 mm (depth gauge)

#### 2. Set manifold-pressure compensator (LDA)

#### 3. Cold start

- Screw in TAS approx. 3 turns
- Set cold-start interlock at engine speed 280 1/min
- Check release at engine speed 100 1/min
- Set TAS to 9.4...9.6 mm at an engine speed of 500 1/min

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
Edition : 03.02.93
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 446 320
Injection pump
Pump designation : PES6MW100/720RS1131
EP type number : 0 413 406 123
Governor
Governor design. : RQV300...1300MW67-8
Governor no. : 0 420 083 290

Customer-spec. information
Customer : MB-NFZ

Engine : OM 366 A

1st version kw : 121.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter
x Wall thickness
x Length mm : 8.00x2.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.60...8.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:

1st rack travel in: 9.50



Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 1100  
Rack travel in m: 10.70...10.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.20...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 300  
Rack travel in m: 9.70...9.90  
3rd pressure hPa : 400  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 850

Del.quantity cm<sup>3</sup>/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...90.0  
1000 s: (77.0...93.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN  
 Edition : 18.12.92  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 125  
 Injection pump  
 Pump designation : PES6MW100/321RS1201  
 EP type number : 0 413 406 190  
 Governor  
 Governor design. : RQV250...975/1200MW1  
 28-1  
 Governor no. : 0 420 083 289

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 14.1...14.3  
 100 s: (13.8...14.6)

Spread cm3 : 0.4  
 100 s: (0.7)

2nd speed rpm : 250.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)

Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
 travel mm : 11.00...11.20

2nd speed rpm : 1050  
 travel mm : 9.30...9.70

3rd speed rpm : 650  
 travel mm : 4.20...4.80

4th speed rpm : 350  
 travel mm : 2.10...2.50

5th speed rpm : 250  
 travel mm : 1.20...1.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 800  
 Aneroid pressure h: 1000  
 Del.quantity : 141.0...143.0  
 1000 : (138.0...146.0)  
 Spread cm3 : 4.00  
 1000 : (7.50)

RATED SPEED

1st version

Control lever  
position degrees: 123...131

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 12.50...12.70  
4th speed rpm : 1200  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.70...12.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 155  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 550  
Rack travel in m: 12.20...12.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 139.0...143.0  
1000 s: (136.0...146.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7197

Start-of-delivery mark is at start of  
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 N  
 Edition : 18.12.92  
 Replaces : 11.92  
 Test oil : ISO-4113

Combination no. : 0 403 466 121

Injection pump  
 Pump designation : PES6MW100/120RS1184  
 EP type number : 0 413 406 171  
 Governor  
 Governor design. : RSV375...1250MW2A334  
 Governor no. : 0 420 085 122

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 BTAA 5.9

1st version kW : 157.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 6.5...7.0

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del. quantity : 124.0...126.0

1000 : (122.0...128.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.30  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
3rd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.50...6.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.60  
2nd pressure hPa : 650  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 720  
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 102.0...104.0  
1000 s: (100.0...106.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 75.0...85.0  
1000 s: (72.0...88.0)

LOW IDLE

Speed rpm : 375  
Rack travel in mm : 6.50...7.00  
Del. quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3280646

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 03.02.93  
 Replaces : 11.92  
 Test oil : ISO-4113

Combination no. : 0 403 466 130

Injection pump  
 Pump designation : FES6Mw100/12ORS1137-  
 2

EP type number : 0 413 406 180  
 Governor  
 Governor design. : RSV550...1100Mw2A335  
 -4

Governer no. : 0 420 085 206

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA

1st version kw : 179.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 15.2...15.4

100 s: (14.9...15.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 550.0

Rack travel in mm : 6.6...7.0

Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 152.5...154.5

1000 : (149.5...157.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.50  
Speed rpm : 1165...1175  
2nd rack travel in: 4.00  
Speed rpm : 1240...1250  
3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.20...6.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 400  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 630  
Rack travel in m: 13.80...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 98.0...100.0  
1000 s: (96.0...102.0)

BREAKAWAY

1st version

G20

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.60...7.00  
Del.quantity cm3/ : 18.5...22.5  
1000 s: (16.0...25.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3925266

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 18.12.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 466 131  
 Injection pump  
 Pump designation : PES6MW100/12ORS1184  
 EP type number : 0 413 406 171  
 Governor  
 Governor design. : RSV375...1250MW2A334  
 -1  
 Governor no. : 0 420 085 207

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 BTA 5.9

1st version kw : 140.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.30...10.40

Del. quantity cm<sup>3</sup>/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 6.8...7.3

Del. quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 800

Del. quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 110...118



Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.30  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1365...1395  
3rd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever  
position degrees: 80...88  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 6.30...6.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...9.90  
2nd pressure hPa : 470  
Rack travel in m: 10.00...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 89.0...91.0  
1000 s: (87.0...93.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...90.0  
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 375  
Rack travel in mm : 6.80...7.30  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3281954

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL  
 Edition : 03.02.93  
 Replaces : 12.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 126  
 Injection pump  
 Pump designation : PES6MW100/320RS1132  
 EP type number : 0 413 406 124  
 Governor  
 Governor design. : RSV300...1050MW4A352  
 Governor no. : 0 420 085 201

Customer-spec. information  
 Customer : VME

Engine : TD 61

1st version kW : 122.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.90...3.00  
 : (2.85...3.05)  
 Rack travel in mm : 9.00...12.00

G23

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 11.10...11.20  
 Del.quantity cm<sup>3</sup>/ : 9.2...9.4  
 100 s: (9.0...9.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.2  
 Del.quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s: (0.9...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del.quantity : 92.0...94.0  
 1000 : (90.0...96.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 116...124

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 10.10

Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
3rd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1000  
Rack travel mm : 11.10...11.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 100  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 160  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 2.5 L  
Edition : 16.02.93  
replaces : 23.11.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2100R415  
Type number : 0 460 414 083  
Customer Part-No. :

Customer-specific information  
Customer : FORD

Engine : 2.5L DI MY 92

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 114

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery block  
Piston stroke mm: 0.35  
mm: 0.30...0.40

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.20...4.60

Shutoff  
electromagnet volt: 12

Supply-pump pressure

Speed 1/min: 500  
Setting value bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000s.: 32.20...33.20

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.0  
1000s.: (4.0)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000s.: 6.00...8.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000s.: (4.0)

Full-load speed regulation

Speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/  
1000s.: 30.50...36.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
mind 1000s.: 50.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2000  
TD travel mm: 7.50...8.30  
mm: (7.20...8.60)

electromagnet Volt: 12  
2nd speed 1/min: 1250  
TD travel mm: 4.20...4.60  
mm: (3.90...4.90)

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 800  
 ID travel mm: 2.00...2.80  
 mm: (1.70...3.10)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump pressure bar: 4.40...5.00  
 bar: (4.20...5.20)

Shutoff  
 electromagnet Volt: 12

2nd speed 1/min: 1000  
 Supply-pump pressure bar: 5.70...6.30  
 bar: (5.50...6.50)

Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 1250  
 Supply-pump pressure bar: 6.20...6.80  
 bar: (6.00...7.00)

Shutoff  
 electromagnet Volt: 12

4th speed 1/min: 2000  
 Supply-pump pressure bar: 7.80...8.40  
 bar: (7.60...8.60)

Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 97.00...141.00  
 (97.00...141.00)

2nd speed 1/min: 1950  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 115.00...184.00  
 (115.00...184.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1950  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.00...38.40  
 1000S.: (34.70...39.70)

2nd speed 1/min: 2400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

3rd speed 1/min: 2200

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 23.20...25.20  
 1000S.: (19.20...29.20)

4th speed 1/min: 2100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.50...36.50  
 1000S.: (27.50...39.50)

5th speed 1/min: 1700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.50...38.90  
 1000S.: (35.20...40.30)

6th speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.20...33.20 E  
 1000S.: (30.20...35.20)

7th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 24.00...28.00 F  
 1000S.: (23.20...29.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet Volt: -

Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.00...8.00  
 1000S.: (3.00...11.00)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (4.0)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 2.00...10.00  
 1000S.: (0.00...10.00)

Part-load del. at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 20.0

1st speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 17.00...20.00  
1000S.: (16.00...21.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

2nd speed 1/min: 480  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.00...31.00  
1000S.: (21.00...31.00)

3rd speed 1/min: 100  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 2.7...2.9  
KF mm: KOT  
MS mm: 1.8  
XK mm: -  
XL mm: -

Remarks:

:  
:

Overflow restriction 0.75 mm - Part No.  
..343,..344

Always pay attention to test instructions for DISTRIBUTOR-TYPE INJECTION PUMPS FOR DI ENGINES!

Information additionally required for testing fuel-injection pump:

TEST PREREQUISITES

Calibrating-oil return temperature with thermometer, °C :45

Calibrating-oil inlet temperature, °C :35...40

Dwell speed, 1/min :1100  
Feedback voltage, mV :-

SETTINGS/TEST SPECIFICATIONS FOR FUEL-INJECTION PUMP, delivery rates

Test speed, 1/min :<500  
Temperature stabilisation speed 1/min :2200  
Output temperature, °C :51  
Measurement temperature, °C:49

Test speed, 1/min :500...799  
Temperature stabilisation speed 1/min :2200  
Output temperature, °C :48  
Measurement temperature, °C:46

Test speed, 1/min :800...1199  
Temperature stabilisation speed 1/min :2200/100  
Output temperature, °C :45  
Measurement temperature, °C:45

Test speed, 1/min :1200...1700  
Temperature stabilisation speed 1/min :100  
Output temperature, °C :42  
Measurement temperature, °C:44

Test speed, 1/min : 1700  
Temperature stabilisation speed 1/min :100  
Output temperature, °C :41  
Measurement temperature, °C:43

Pump/engine assignment:  
Attach timing device cover KDEP 1151.  
Plunger lift in blocking position =  
0.30...  
0.40 mm referenced to outlet "B".



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 15.02.93  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R514  
Type number : 0 460 414 100  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8142.47.1811

Power KW: 85

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 2.00...2.40  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 58.00...59.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000S.: 25.00...26.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 22.00...28.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 24

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 1000



Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: - 28.0...30.0 #  
Shutoff  
electromagnet Volt: 24  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1250  
Charge press hPa: 1000  
Supply pump  
pressure  
difference bar: - 0.1...0.3 #  
Shutoff  
electromagnet Volt: 24.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 3.60...4.40  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.00...2.40  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 0.20...1.00  
mm: (0.00...1.30)

Shutoff  
electromagnet volt: 24  
5th speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 4.50...5.30  
mm: (4.20...5.60)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.60...4.20  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1900  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 7.60...8.20  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.7  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 43.00...44.00  
1000S.: (39.50...47.50)  
2nd speed 1/min: 2250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 2100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000S.: (20.50...29.50)  
8th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 41.00...49.00  
1000S.: (39.00...51.00)  
9th speed 1/min: 1900  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 58.00...63.00  
1000S.: (57.00...64.00)  
12th speed 1/min: 1750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 58.00...59.00  
1000S.: (55.00...62.00)  
15th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 52.50...57.50  
1000S.: (51.00...59.00)  
18th speed 1/min: 550  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 25.00...26.00  
1000S.: (22.00...29.00)  
20th speed 1/min: 800  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 49.50...58.50  
1000S.: (48.50...59.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 325  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 325  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)  
Dispersion cm<sup>3</sup>/: 6.0  
1000S.: (6.5)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/ : - 27.0...35.0"  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: MAX:  
difference 1000S.: 2.00...8.00

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: 1000  
TD-travel : -0.7...0.9 "  
difference mm: -  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
TD-travel : - 0.6...1.4 '  
difference mm: -

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 55.00...105.00  
1000S.: (55.00...105.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 14.00...30.00  
1000S.: (14.00...30.00)

4th speed 1/min: 100  
Shutoff  
electromagnet volt: 24  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Remarks:

:  
:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

Always pay attention to test instructions for DISTRIBUTOR-TYPE INJECTION PUMPS FOR DI ENGINES!

Information additionally required for testing fuel-injection pump:

TEST PREREQUISITES

Calibrating-oil return temperature with thermometer, °C :45

Calibrating-oil inlet temperature, °C :35...40

Dwell speed, 1/min :1100

Feedback voltage, mV :-

SETTINGS/TEST SPECIFICATIONS FOR FUEL-INJECTION PUMP, delivery rates

Test speed, 1/min :<500

Temperature stabilisation

speed 1/min :2100

Output temperature, °C :51

Measurement temperature, °C:49

Test speed, 1/min :500...799

Temperature stabilisation

speed 1/min :2100

Output temperature, °C :48

Measurement temperature, °C:46

Test speed, 1/min :800...1199

Temperature stabilisation

speed 1/min :2100/100

Output temperature, °C :45

Measurement temperature, °C:45

Test speed, 1/min :1200...1700

Temperature stabilisation

speed 1/min :100

Output temperature, °C :42

Measurement temperature, °C:44

Test speed, 1/min : 1700

Temperature stabilisation

speed 1/min :100

Output temperature, °C :41

Measurement temperature, °C:43

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 7,2 P  
Edition : 15.02.93  
replaces : 23.07.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1350R417  
Type number : 0 460 416 068  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0826 F01/OH

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 800  
Setting value mm: 3.80...4.20

## Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 5.00...5.60

## Full-load del. with charge press.:

Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 75.70...76.70  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...13.00  
Del. quantity cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 1410  
Del. quantity cm<sup>3</sup>/  
1000S.: 57.00...63.00

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1350  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)  
3rd speed 1/min: 800  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)  
4th speed 1/min: 600  
TD travel mm: 2.50...3.30  
mm: (2.20...3.60)  
6th speed 1/min: 1000  
TD travel mm: 4.40...5.20  
mm: (4.10...5.50)

## Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 4.20...4.80  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 5.00...5.60  
3rd speed 1/min: 1350

Supply-pump  
pressure bar: 7.00...7.60  
4th speed 1/min: 1000  
Supply-pump  
pressure bar: 5.80...6.40

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 1350  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...153.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1550  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)  
3rd speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...15.00  
(0.00...15.00)  
4th speed 1/min: 1450  
Del. quantity cm<sup>3</sup>/1000S.: 15.00...45.00  
(15.00...45.00)  
5th speed 1/min: 1410  
Del. quantity cm<sup>3</sup>/1000S.: 57.00...63.00  
(55.50...64.50)  
9th speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/1000S.: 75.20...78.20  
(73.70...79.70)  
11th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/1000S.: 74.20...78.20  
(72.70...79.70)  
12th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 75.70...76.70  
(73.70...78.70)  
20th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/1000S.: 58.50...64.50  
(57.50...65.50)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/1000S.: 7.00...13.00  
(5.00...15.00)  
Dispersion cm<sup>3</sup>/1000S.: 6.0  
(6.5)  
2nd speed 1/min: 450

H06

Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000S.: 60.00...120.00  
(60.00...120.00)

2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000S.: 40.00...70.00  
(40.00...70.00)

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/1000S.: 40.00...80.00  
(40.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: K-OT  
MS mm: 1.0...1.4  
SVS max. mm: 3,7

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL  
Edition : 12.02.93  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1950L448  
Type number : 0 460 426 193  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : TD 42A

Power KW: 170

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 901 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.3  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1500  
Setting value mm: 2.40...2.80

Supply-pump pressure

H07

Speed 1/min: 1500  
Charge press hPa: 1500  
Setting value bar: 7.7...8.3

## Full-load del. with charge press.:

Speed 1/min: 1800  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/  
1000S.: 130.7...131,7  
Dispersion cm<sup>3</sup>/: 5.0

## Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 58,50...59.50

## Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 17.00...21.00  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: -

## Full-load speed regulation

Speed 1/min: 2150  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 24.00...30.00

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
mind 1000S.: 80.00

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 1100  
Charge press hPa: 1500  
TD travel mm: 0.60...1.60  
mm: (0.40...1.80)

2nd speed 1/min: 1500  
Charge press hPa: 1500  
TD travel mm: 2.40...2.80  
mm: (2.10...3.10)

3rd speed 1/min: 1900  
Charge press hPa: 1500  
TD travel mm: 4.10...4.90  
mm: (3.80...5.20)

## Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 4.80...5.40  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 6.50...7.10  
 3rd speed 1/min: 1500  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 7.70...8.30  
 4th speed 1/min: 1900  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 8.80...9.40

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 1500  
 Overflow quantity cm<sup>3</sup>/10s: 75.00...119.40  
 (60.00...134.40)  
 2nd speed 1/min: 1950  
 Charge press. hPa: 1500  
 Overflow quantity cm<sup>3</sup>/10s: 97.20...180.50  
 (82.20...195.50)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
 Charge-air pressure-setting point hPa: 700\*  
 LDA-stroke mm: 7.5  
 Del. quantity cm<sup>3</sup>/1000S.: 89.50...90.50  
 (84.00...96.00)  
 2nd speed 1/min: 2300  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
 -  
 3rd speed 1/min: 2150  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 24.00...30.00  
 (21.00...33.00)  
 4th speed 1/min: 2050  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 101.00...115.00  
 (94.00...122.00)  
 5th speed 1/min: 1950  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 124.00...128.00  
 (123.00...129.00)  
 6th speed 1/min: 1800  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 130.70...131.70  
 (129.20...133.20)  
 7th speed 1/min: 1500  
 Charge press. hPa: 1500

Del. quantity cm<sup>3</sup>/1000S.: 135.00...140.00  
 (134.00...141.00)  
 8th speed 1/min: 1100  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 84.50...88.50  
 (83.00...90.00)  
 9th speed 1/min: 900  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 123.50...128.50  
 (122.50...129.50)  
 10th speed 1/min: 600  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 117.00...121.00  
 (115.00...123.00)  
 11th speed 1/min: 600  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/1000S.: 58.50...59.50  
 (57.00...61.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1950  
 Charge press. hPa: 1500  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
 -

Electr. shutoff:

1st speed 1/min: 400  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
 -  
 Shutoff electromagnet volt: 12.0

Idle delivery:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/1000S.: 17.00...21.00  
 (15.00...23.00)  
 Dispersion cm<sup>3</sup>/1000S.: 5.0  
 -  
 2nd speed 1/min: 550  
 Del. quantity cm<sup>3</sup>/1000S.: 0.0...3.0  
 -  
 3rd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/1000S.: 6.00...12.00  
 (4.00...14.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/1000S.: 60.00...90.00  
 -  
 2nd speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/1000S.: 80.00...140.00  
 -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: K-OF
MS	mm: -
SVS max.	mm: 2,6
LDA stroke	mm: 7.5

Remarks:

⋮  
⋮

Pushing electromagnet.

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 15.02.93  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R496  
Type number : 0 460 426 209  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0826 LF 07

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 2.00...2.40

Supply-pump pressure

H10

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 7.30...7.90

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 93.50...94.50  
Dispersion cm<sup>3</sup>/  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 59.50...60.50

Low-idle speed regulation

Speed 1/min: 250  
Del. quantity cm<sup>3</sup>/  
1000S.: 16.50...23.50  
Del. quantity cm<sup>3</sup>/  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1280  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 62.00...68.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/  
mind 1000S.: 60.00...100.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 950  
Charge press hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 2.00...2.40  
mm: (1.50...2.90)

4th speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.50...6.10  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.30...7.90  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 9.00...9.60

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40 (26.70...98.40)  
 2nd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00 (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting point hPa: 450  
 LDA-stroke mm: 7.5  
 Del. quantity cm<sup>3</sup>/1000S.: 92.50...93.50 (90.50...95.50)  
 2nd speed 1/min: 1450  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00 (0.00...3.00)  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...15.00 (0.00...15.00)  
 4th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 15.00...55.00 (15.00...55.00)  
 5th speed 1/min: 1280  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 62.00...68.00 (60.50...69.50)  
 9th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 88.20...93.20 (86.70...94.70)  
 12th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 73.50...94.50 (91.50...96.50)  
 15th speed 1/min: 800  
 Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/1000S.: 92.90...97.90 (91.40...99.40)  
 17th speed 1/min: 600  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 98.60...103.60 (97.10...105.10)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/1000S.: 59.50...60.50 (57.50...62.50)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 102.40...111.40 (100.90...112.90)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00 (0.00...3.00)

Shutoff electromagnet volt: -

Idle delivery:

1st speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/1000S.: 16.50...23.50 (14.50...25.50)  
 Dispersion cm<sup>3</sup>/1000S.: 6.0 (6.5)  
 2nd speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00 (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 330  
 Del. quantity cm<sup>3</sup>/1000S.: 70.00...100.00 (70.00...100.00)  
 2nd speed 1/min: 430  
 Del. quantity cm<sup>3</sup>/1000S.: 40.00...70.00 (40.00...70.00)  
 4th speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/1000S.: 60.00...100.00 (60.00...100.00)

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: K-OT  
 MS mm: 0.9...1.3  
 LDA stroke mm: 7.5

Remarks:  
 :

:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN
Edition : 15.02.93
replaces : -
Calibrating oil : ISO-4113
Injection pump : VE4/8F2300R317-6
Type number : 0 460 484 061
Customer Part-No. :

Customer-specific information
Customer : RENAULT

Engine : F8Q - 706 CA

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil
return temp. °C
with thermometer : 40.00...48.00
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
Pressure bar: 127.00...130.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00
x Wall thickness : 2.00
x Length mm: 450

Start of delivery
Prestroke mm: -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250
Setting value mm: 3.20...3.60
Shutoff
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250
Setting value bar: 4.40...5.00
Shutoff
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250
Del. quantity cm3/
1000S.: 31.60...32.60
Shutoff
electromagnet Volt: 12.0
Dispersion cm3/: 2.5
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 410
Del. quantity cm3/
1000S.: 7.5...11.5
Shutoff
electromagnet Volt: 12.0
Del. quantity cm3/: 2.5
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500
Del. quantity cm3/
1000S.: 1.00...5.00
Shutoff
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2450
Del. quantity cm3/
1000S.: 23.00...29.00
Shutoff
electromagnet Volt: 12.0

Start:

Speed 1/min: 100
Del. quantity cm3/: 40.00...70.00
mind 1000S.: 40.00
Shutoff
electromagnet Volt: 12

Load-dependent start of delivery:
Inj.-qty.dif.measurement:

Speed 1/min: 1250
Inj.-qty. cm3/
difference 1000S.: - 10.5..12.5 #
Shutoff
electromagnet Volt: 12
SP press.-dif.measurement
pompa di mandata (FP)
1.Speed 1/min: 1250

Supply pump  
pressure  
difference bar: - 0.1...0.3 #  
Shutoff  
electromagnet Volt: 12.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 5.80...6.60  
mm: (5.50...6.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 3.20...3.60  
mm: (2.70...4.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 500  
TD travel mm: 2.20...4.60  
mm: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 310  
TD travel mm: 1.00...3.40  
mm: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 3.10...3.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

H14

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...15.00  
1000S.: (6.00...16.00)

5th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000S.: (21.00...29.00)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...33.50  
1000S.: (30.20...34.80)

10th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.30...32.30  
1000S.: (29.00...33.60)

11th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.70...32.70  
1000S.: (28.90...33.50)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...32.00  
1000S.: (29.20...33.80)

20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.10...33.10  
1000S.: (29.30...33.90)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.50...11.50  
1000S.: (5.50...13.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1.Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/ : -13.2..17.2 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: MAX:2.0..8.0'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12.0

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1250  
TD-travel : - 0.4..0.6 "  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
TD-travel : - 0.3..0.70 '  
difference mm: -

SP press.-dif.measurement:

pompa di mandata (FP):  
1st speed 1/min: 1250

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.5  
MS mm: 1.1...1.5  
SVS max. mm: 2.0  
LDA stroke mm: LD =  
HBA stroke mm: 7,5...8.5

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW 2.4 S7  
Edition : 11.11.92  
replaces : 03.02.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L358  
Type number : 0 460 485 003

Customer-specific information  
Customer : VW

Engine : 153-2.4L.-T4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Setting value mm: 1.5...1.9  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5,7...6,3

Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 36,0...37,0

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/  
1000S.: (3,0)

## Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,0

## Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6,5...7,5

Shutoff  
electromagnet Volt: 12

## Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14,00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: 3.5...9.5 \*

Shutoff  
electromagnet Volt: 12

## TD-travel dif.measurement correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.3...0.5 \*

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2100  
TD travel mm: 5,30...6,10  
mm: (5,00...6,40)  
electromagnet Volt: 12  
2nd speed 1/min: 1790  
TD travel mm: 4,60...5,40  
mm: (4,30...5,70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 1,50...1,90  
mm: (1,00...2,40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,80...4,40  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250

Supply-pump  
pressure bar: 5,70...6,30  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100

Supply-pump  
pressure bar: 8,10...8,70  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41,70...83,40  
quantity cm<sup>3</sup>/10s: (27,80...97,30)  
2nd speed 1/min: 2100

Shutoff  
electromagnet Volt: 12  
Overflow : 55,60...138,90  
quantity cm<sup>3</sup>/10s: (41,70...152,90)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12

H17

Del. quantity cm<sup>3</sup>/: 0,00...6,00  
1000S.: -

2nd speed 1/min: 2400

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10,00...14,00  
1000S.: (8,00...16,00)

3rd speed 1/min: 2300

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17,00...27,00  
1000S.: (16,00...28,00)

4th speed 1/min: 2100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29,50...31,50  
1000S.: (28,30...32,70)

5th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36,00...37,00  
1000S.: (34,30...38,70)

6th speed 1/min: 600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32,30...35,30  
1000S.: (30,80...36,80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: 0,00...3,00  
1000S.: -

Shutoff  
electromagnet Volt: -

Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7,00...9,00  
1000S.: (4,00...12,00)

Residual:

1. Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6,50...7,50  
1000S.: (5,00...9,00)

2nd speed 1/min: 490

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6,80...8,80  
1000S.: (5,30...10,30)

Load-dependent start of delivery:



Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/ : MAX. ..3,00 #  
difference 1000S.: -  
Shutoff  
electromagnet volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : 0,90...1,30 #  
difference mm: (0,50...1,70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : 0,80...1,20  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35,00...85,00  
1000S.: -

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17,00...37,00  
1000S.: -

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35,00...85,00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm: 3,2...3,4  
KF mm: K-OT  
MS mm: 1,2...1,6  
SVS max. mm: 2,4

Remarks:

H18

Following pump adjustment, screw out residual-quantity adjusting screw 2 mm.

On initial measurement, screw in residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 12.02.93  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200L153-2  
Type number : 0 460 494 303  
Customer Part-No. :

Customer-specific information  
Customer : RNJR

Engine : J8S

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...48.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>:/  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.00...38.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...11.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.00...29.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...80.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press hPa: 800  
TD travel mm: 1.90...2.70  
mm: (1.60...3.00)  
electromagnet Volt: 12.0

2nd speed 1/min: 1400  
Charge press hPa: 800  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1800  
Charge press hPa: 800  
TD travel mm: 5.70...6.50  
mm: (5.40...6.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2000  
Charge press hPa: 800  
TD travel mm: 6.2...7.0  
mm: -

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: -  
Supply-pump pressure bar: 2.60...3.20

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
Supply-pump pressure bar: 5.10...5.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump pressure bar: 6.90...7.50

Shutoff  
electromagnet Volt: 12

Over-flow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12.0  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)

2nd speed 1/min: 2000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting point hPa: 200  
LDA-stroke mm: 4.5

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 41.00...42.00  
(38.50...44.50)

3rd speed 1/min: 2700  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
-

4th speed 1/min: 2500  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000S.: 2.50...17.50  
-

5th speed 1/min: 2400  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000S.: 23.00...29.00  
(22.00...30.00)

6th speed 1/min: 2000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000S.: 43.40...45.40  
(42.10...46.70)

7th speed 1/min: 1400  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000S.: 47.00...48.00  
(45.20...49.80)

8th speed 1/min: 1000  
Charge press. hPa: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 44.90...47.90  
(43.40...49.40)

9th speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 37.00...38.00  
(34.50...40.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 425

Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.50  
1000S.: (5.00...13.00)

Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 520

Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...7.00  
1000S.: (1.00...9.00)

3rd speed 1/min: 660

Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 300

Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: -

2nd speed 1/min: 180

Shutoff  
electromagnet volt: 12.0  
Del. quantity cm<sup>3</sup>/: 40.00...100.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.3...1.7  
SVS max. mm: 3.0  
LDA stroke mm: 4.5

Remarks:

:  
:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW
Edition : 15.02.93
replaces : 13.04.92
Calibrating oil : ISO-4113
Injection pump : VE4/9F2100R471
Type number : 0 460 494 308
Customer Part-No. :

Customer-specific information
Customer : VW

Engine : 1,9 L UD T4

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil
return temp. °C
with thermometer : 40.00...48.00
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder
assembly : 1 688 901 000

Opening
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00
x Wall thickness : 2.00
x Length mm: 840

Start of delivery
Prestroke mm: -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250
Setting value mm: 3.70...4.10
Shutoff
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250
Setting value bar: 5.30...5.90
Shutoff
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250
Del. quantity cm3/
1000S.: 43.00...44.00
Shutoff
electromagnet Volt: 12.0
Dispersion cm3/: 2.5
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 425
Del. quantity cm3/
1000S.: 7.00...9.00
Shutoff
electromagnet Volt: 12.0
Del. quantity cm3/: 2.0
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550
Del. quantity cm3/
1000S.: 5.50...6.50
Shutoff
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400
Del. quantity cm3/
1000S.: 12.00...16.00
Shutoff
electromagnet Volt: 12

Start:

Speed 1/min: 100
Del. quantity cm3/: 40.00...90.00
mind 1000S.: 40.00
Shutoff
electromagnet Volt: 12

Load-dependent start of delivery:
Inj.-qty.dif.measurement:

Speed 1/min: 1250
Inj.-qty. cm3/
difference 1000S.: 6.00...8.00 #
Shutoff
electromagnet Volt: 12
SP press.-dif.measurement
pompa di mandata (FP)
1.Speed 1/min: 1250

Supply pump  
pressure difference bar: 0.10...0.30 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.10...1.90  
mm: (0.70...2.30)  
electromagnet Volt: 12.0  
2nd speed 1/min: 1250  
TD travel mm: 3.70...4.10  
mm: (3.10...4.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1700  
TD travel mm: 5.60...6.40  
mm: (5.20...6.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump pressure bar: 3.80...4.40  
Shutoff  
electromagnet volt: 12  
2nd speed 1/min: 1250  
Supply-pump pressure bar: 5.30...5.90  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1700  
Supply-pump pressure bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(27.80...97.30)  
2nd speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...138.90  
(41.70...153.90)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Shutoff  
electromagnet volt: 12.0  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00

2nd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 12.00...16.00  
(10.00...18.00)

3rd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000s.: 25.00...35.00  
(24.00...36.00)

4th speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000s.: 41.1...43.10  
(39.90...44.30)

5th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 43.00...44.00  
(41.30...45.70)

6th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000s.: 34.30...37.30  
(32.80...38.80)

7th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/1000s.: 32.30...38.30  
(29.80...40.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)  
Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 7.00...9.00  
(4.00...12.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...6.50  
1000S.: (4.00...8.00)

2nd speed 1/min: 515  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...7.50  
1000S.: (4.00...9.00)

Load-dependent start of delivery:  
Inj.-qty. dif. measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/ : - 7.0..13.0 "  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12.0  
2nd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: MAX.  
difference 1000S.: 0.00...3.00 "

Shutoff  
electromagnet Volt: 12.0  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: ALFB: 0..0.6  
difference 1000S.: -

KSB/AFB  
valve Volt: 12.0  
Shutoff  
electromagnet Volt: 12.0

TD-travel dif. measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1250  
TD-travel : - 0.9...1.1 "  
difference mm: (0.30...0.50)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
TD-travel : - 1.3...1.7 "  
difference mm: -

Shutoff  
electromagnet Volt: 12.0

SP press.-dif. measurement:  
pompa di mandata (FP):

1st speed 1/min: 1250  
Supply pump-  
pressure : - 0.7...1.1 "  
difference bar: -

Shutoff  
electromagnet Volt: 12.0

Part-load del. at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (25.00...31.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
1000S.: (40.00...90.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...90.00  
1000S.: (40.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.2...1.4

Remarks:

:

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 12.02.93  
replaces : 13.04.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F205UR476  
Type number : O 460 494 317  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8144.97.2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1,0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 1000  
Setting value mm: 5.10...5.50  
Shutoff  
electromagnet Volt: 12

H25

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 67.50...68.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 41.50...42.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000S.: 10,5...14,5

Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 2,5  
1000S.: -

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000S.: 0.50...5.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 35.00...41.00

Shutoff  
electromagnet Volt: 12.0

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...74.00  
mind 1000S.: 50.00



Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: - 19.0...21.0 #  
Shutoff

electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)

1.Speed 1/min: 1000  
Charge press hPa: 1000  
Supply pump  
pressure  
difference bar: -0.10...0.30#  
Shutoff  
electromagnet Volt: 12.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1800  
Charge press hPa: 1000  
TD travel mm: 8.10...8.90  
mm: (7.80...9.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1400  
Charge press hPa: 1000  
TD travel mm: 5.10...5.50  
mm: (4.80...5.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2050  
Charge press. hPa: 1000  
TD travel mm: 9.60...10.40  
mm: (9.30...10.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.10...3.70  
Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.10...6.70  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8.40...9.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff

electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.70...98.40)  
2nd speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff

electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 350\*  
LDA-stroke mm: 4,5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 47.50...48.50  
1000S.: (45.50...50.50)

2nd speed 1/min: 2750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...41.00  
1000S.: (34.00...42.00)

9th speed 1/min: 2050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 68.00...71.00  
1000S.: (67.30...71.70)

12th speed 1/min: 1200  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 67.50...68.50  
1000S.: (66.00...70.00)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 41.50...42.50  
1000S.: (39.50...44.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.50...14.50  
1000S.: (9.50...15.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...15.00  
1000S.: (10.00...16.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.50...5.50  
1000S.: -  
Del. quantity cm<sup>3</sup>/: 0.00...2.00

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/ : -18.0...26.0"  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000

Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: MAX.  
difference 1000S.: 4.00...9.00  
Shutoff  
electromagnet Volt: 12.0

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD-travel : -0.70...0.90"  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
TD-travel : -1,10...1.9 "

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...24.00  
1000S.: (20.50...25.50)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...74.00  
1000S.: (50.00...74.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.00...48.00  
1000S.: (36.00...48.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...74.00  
1000S.: (50.00...74.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.6...6.0
MS	mm: 1.1...1.5
LDA stroke	mm: 4.5

Adjustment Potentiometer:

Angle pot.	°: 25
Supply voltage pot.	volt: 5.0
Output volt pot.	volt: 2.1

Remarks:

⋮

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 12.02.93  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2350R309-3  
Type number : 0 460 494 324  
Customer Part-No. :

Customer-specific information  
Customer : REN

Engine : J8S R21 EURO 93

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1125  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1125  
Setting value bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1125  
Del. quantity cm3/  
1000S.: 36.20...37.20

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2,5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 6.00...10.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2,5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12.0

Full-load speed regulation

Speed 1/min: 2500  
Del. quantity cm3/  
1000S.: 20.00...26.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 52.00...92.00  
mind 1000S.: 52.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1125  
Inj.-qty. cm3/  
difference 1000S.: 10.00...12.00 #

Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1125

Supply pump  
pressure  
difference bar: 0.10...0.30 #  
Shutoff  
electromagnet Volt: 12.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

electromagnet Volt: 12.0  
2nd speed 1/min: 1125  
TD travel mm: 2.60...3.00  
mm: (2.10...3.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
TD travel mm: 7.10...7.90  
mm: (6.80...8.20)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3.10...3.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1125  
Supply-pump  
pressure bar: 4.20...4.80  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.50...7.10  
Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1125  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 36.20...37.20  
1000S.: (34.40...39.00)

2nd speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.70...36.70  
1000S.: (32.9...37.50)

3rd speed 1/min: 1750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.90...36.90  
1000S.: (33.60...38.20)

4th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.20...37.20  
1000S.: (33.90...38.50)

5th speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...26.0  
1000S.: (19.00...27.00)

6th speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 2.50...10.5  
1000S.: (1.50...11.50)

7th speed 1/min: 2750  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (4.00...12.00)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (6.50...14.50)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 2.00...6.00  
1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/ : 11.0...15.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1125  
Inj.-qty. cm<sup>3</sup>/: MAX.  
difference 1000S.: 2.00...8.00 '  
Shutoff  
electromagnet Volt: 12.0

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1125  
TD-travel : 0.50...0.70 "  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1125  
TD-travel : 1.10...1.50 '  
difference mm: -  
Shutoff  
electromagnet Volt: 12.0

Automatic starting fuel delivery:

1st speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

2nd speed 1/min: 210  
Shutoff  
electromagnet Volt: 12.0  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.3...1.7  
SVS max. mm: 3.0

Remarks:

:  
:  
On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 c7  
 Edition : 08.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 936  
 Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-14  
 Governor no. : 0 420 021 142

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1-2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.55...0.65

100 s: (0.45...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
                          : (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
                  1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
          1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
          1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
          1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.5...6.5  
                  1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
          1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm3/ : -  
                  1000 s: (41,0...49,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current

short-duration A : 3.0

#### Starting test

Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0 1,8A



Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device

KDEP 1077 = 19.3°...19.7°

(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472...2.532 V must be attained.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 c7  
 Edition : 27.10.92  
 Replaces : 08.10.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 936  
 Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-14  
 Governor no. : 0 420 021 142

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.55...0.65

100 s: (0.45...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3.0

Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°

(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472...2.532 V must be attained.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position: 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 27.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 936  
 Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M64-14  
 Governor no. : 0 420 021 142

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 144...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.2...5.3

100 s: (5 1...5.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.65...0.75

100 s: (0.55...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 52.5...53.5

1000 : (51.5...54.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
                  : (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 51.0...52.5  
                  1000 s: (50.0...53.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                  1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
                  1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 53.0...0.0  
                  1000 s: (53.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 6.5...7.5  
                  1000 s: (5.5...10.0)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
                  1000 s: (42,0...50,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 53,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEF 1077 =  $19.3^\circ \dots 19.7^\circ$

( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm

control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEF-P400

##### Receiving inspection

Shift control lever to full-load stop.

Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

##### RWG adjustment

At engine speed of 1000 1/min set delivery rate of 25.0...26.0 (24.0...27.0) ccm/1000 strokes with control lever. Shift RWG until  $U = 1.633 \dots 1.639$  ( $1.635 \dots 1.637$ ) V is indicated. Tighten fastening screws to 1...2 Nm. Move control lever to full-load stop; voltage value of 2.472...2.532 V must be attained.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $35.5^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position  $33.0^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C2  
 Edition : 14.10.91  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 937  
 Injection pump  
 Pump designation : PESSM55C32ORS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M74  
 Governor no. : 0 420 021 140

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temperature °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever



position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 150  
Minimum rack travel: 11.00  
Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.2...4.4  
                                  : (4.1...4.5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                          1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.5)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                          1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                          1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                          1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

#### LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                          1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 370  
Rack travel in mm : (10.0...11.4)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (31,5...39,5)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 345$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF  
-Control-lever position  $35,5^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING  
(ARD)  
Control lever on full-load stop. At  $n =$   
1000 min<sup>-1</sup>,  
 $I = 2.5$  A, difference in delivery  
referenced to full-load  
delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19,3^\circ \dots 19,7^\circ$   
( $19,2^\circ \dots 19,8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Spring-retainer setting: at 1000 min<sup>-1</sup>  
= 1.7...1.8 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection  
Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1,633 \dots 1,639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C2  
 Edition : 28.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 075 937

Injection pump  
 Pump designation : PES5M55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M74  
 Governor no. : 0 420 021 140

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.1...8.5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.4

Testing:

Speed rpm : 150  
Minimum rack travel: 10.0+1  
Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.2...4.4  
                          : (4.1...4.5)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
                          1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.5)  
Aneroid pressure h: 1850  
Speed rpm : 2200

Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                          1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                          1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                          1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                          1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 370  
Rack travel in mm : (10.0...11.4)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (31,5...39,5)  
Current A : 1.8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1.8A

Remarks:

\* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.

At  $n = 345$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $35,5^\circ$ , max.

0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.

-Control-lever position  $33,0^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING  
(ARD)

Control lever on full-load stop. At  $n =$   
1000 min.  $-1$ ,

$I = 2.5$  A, difference in delivery  
referenced to full-load  
delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system:  
adjustment and blocking with device

KDEP 1077 =  $19,3^\circ \dots 19,7^\circ$

( $19,2 \dots 19,8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm

control-rod travel at correction  
screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 28.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 937  
 Injection pump  
 Pump designation : PESSM55C320RS158  
 EP type number : 0 410 055 986  
 Governor  
 Governor design. : RSF340/2300M74  
 Governor no. : 0 420 021 140

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-Abgasl.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 5.2...5.3

100 s : (5.1...5.4)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 345.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 0.6...0.7

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 52.5...53.5

1000 : (51.5...54.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12 FD<270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 150 \*  
Minimum rack trave: 10,0+1  
Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### LOW IDLE 2

##### Control lever

position degrees: 8-12FD 270  
Setting point w/out bumper spring  
Speed rpm : 345  
Rack travel in mm : 5.3...5.5

#### Testing:

Speed rpm : 220  
Rack travel in mm : 8,0\*\*  
Speed rpm : 345  
Rack travel in mm : 5,3...5,5  
Speed rpm : 540  
Rack travel in mm : 2,5  
Speed rpm : 640  
Rack travel in mm : 2,5

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

##### Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude

##### Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050

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Rack travel in m: 3.90...4.20  
2nd pressure hPa : 750  
Rack travel in m: 5.70...6.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 51.0...52.5  
1000 s: (50.0...53.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 53.0...0.0  
1000 s: (53.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 345  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 370  
Rack travel in mm : (10,0...11,4)  
Del. quantity cm<sup>3</sup>/ : -  
1000 s : (32,5...40,5)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s : 53,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.25 mm

\* Sliding sleeve pre-travel = 4.7 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.  
0.2 mm control-rod travel deduction

ad

allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 42,0°,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 345 1/min and pu = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Testing and adjusting the control-rod-

travel sensor with evaluation circuit  
KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.472...2.532  
(2.442...2.562) V must be displayed  
on the digital voltmeter.

#### RWG adjustment

At engine speed of 1000 1/min  
set delivery rate of 25.0...26.0  
(24.0...27.0) ccm/1000 strokes  
with control lever. Shift RWG until  
U = 1.633...1.639 (1.635...1.637)V  
is indicated. Tighten fastening  
screws to 1...2 Nm. Move control  
lever to full-load stop; voltage  
value of 2.472...2.532 V must be  
attained.

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min. -1

I = 2.5 A, difference in delivery referenced to  
delivery (5.6...7.6) ccm/1000 strokes.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2.5 C10  
 Edition : 13.11.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 944  
 Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Customer-spec. information

Customer : MB-PKW  
 Engine : OM602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288  
 Tolerance + - ° : 0.00 (1.00)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 14.00...14.10  
 Del. quantity cm<sup>3</sup>/ : 5.1...5.2  
 100 s : (5.0...5.3)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.3)

2nd speed rpm : 315.0  
 Rack travel in mm : 6.0...6.2  
 Del. quantity cm<sup>3</sup>/ : 0.5...0.6  
 100 s : (0.4...0.8)  
 Spread cm<sup>3</sup> : 0.1  
 100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del. quantity : 51.0...52.0  
 1000 : (50.0...53.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0  
 3rd rack travel in: 8,7...9,1  
 Speed rpm : 2500  
 4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever  
 position degrees: 8...12  
 Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.50  
Speed rpm : -  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,7...4,9  
: (4,6...5,0)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1600  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 2200  
Rack travel in m: 12.50...12.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 49.5...51.0  
1000 s: (48.5...52.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0  
1000 s: -  
Rack travel in mm : 20.1

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.70...9.10  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,8...14,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095...2.105$  (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 3.230...3.310 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C10  
 Edition : 14.10.91  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump  
 Pump designation : PESSM55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300F64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T3

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

J25

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.7...4.9  
                  : (4.6...5.0)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 49.5...51.0  
                  1000 s: (48.5...52.0)  
Spread cm3 : 2.50  
                  1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
                  1000 s: (47.5...51.5)

Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
                  1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 29.0...33.0  
                  1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm3/ : -  
                  1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52.0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position  $35.5^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position  $33.0^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop. With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 =  $16.8^\circ \dots 17.2^\circ$  ( $16.7 \dots 17.3^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

##### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 (17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633 \dots 1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C10  
 Edition : 28.10.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump  
 Pump designation : PES5M55C320RS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.85)

Spread cm<sup>3</sup> : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Speed rpm : 1000  
Maximum rack travel: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4.7...4.9  
                                  : (4.6...5.0)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
Rack travel in m: 4.90...5.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 49.5...51.0  
                                  1000 s: (48.5...52.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
                                  1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
                                  1000 s: (32.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
                                  1000 s: (28.0...34.0)  
Spread cm<sup>3</sup> : 2.50  
                                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                                  1000 s: (4.0...8.5)  
Spread cm<sup>3</sup> : 1.00  
                                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12.6...14.0)  
Del.quantity cm<sup>3</sup>/ : -  
                                  1000 s: (41.0...49.0)  
Current A : 1.8

#### Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0.0...1.0  
Current short-duration A : 3.0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52.0 1,8A

Remarks:



Sliding sleeve pre-travel = 6.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop. With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

- Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 (17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 1.633...1.639$  (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 28.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 075 944  
 Injection pump  
 Pump designation : PES5M55C32ORS177  
 EP type number : 0 410 055 974  
 Governor  
 Governor design. : RSF340/2300M64-12  
 Governor no. : 0 420 021 127

Cust. part no. : T8

Customer-spec. information  
 Customer : MB-PKW

Engine : OM602A-USA MJ90

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 688 901 111

Opening  
 pressure, bar : 144...150

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

K03

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13,70...13.80

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s : (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.7...52.7

1000 : (50.7...53.7)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.7

Testing:

Speed rpm : 220  
Minimum rack travel: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,7...4,9  
                                      : (4,6...5,0)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
    Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
    Rack travel in m: 13.00...13.20  
3rd speed rpm : 2200  
    Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.30...0.70

Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
    Rack travel in m: 3.40...3.60  
2nd pressure hPa : 750  
    Rack travel in m: 4.90...5.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
    1000 s: (49.0...52.5)  
Spread cm<sup>3</sup> : 2.50  
    1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
    1000 s: (47.5...51.5)

Spread cm<sup>3</sup> : 2.50  
    1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 34.0...35.0  
    1000 s: (33.0...36.0)  
Spread cm<sup>3</sup> : 2.50  
    1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 54.0  
    1000 s: -  
Rack travel in mm : 20.1

HIGH IDLE

1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
    1000 s: (29.0...35.0)  
Spread cm<sup>3</sup> : 2.50  
    1000 s: (3.00)

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
    1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
    1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 340  
Rack travel in mm : (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
    1000 s: (42,5...50,5)  
Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 54,0 / 1,8A

Remarks:

CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35.5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

RWG adjustment

At engine speed of 1000 1/min set delivery rate of 19.0...20.0 (18.0...21.0) ccm/1000 strokes with control lever. Shift RWG until  $U = 1.633...1.639$  (1.635...1.637)V is indicated. Tighten fastening screws to 1...2 Nm. Move control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.

Testing and adjusting the control-rod-travel sensor with evaluation circuit

KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547

(2.457...2.577) V must be displayed on the digital voltmeter.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 01.09.92  
 Replaces : 14.10.91  
 Test oil : ISO-4113

Combination no. : 0 400 076 968

Injection pump  
 Pump designation : PES6M55C320RS178  
 EP type number : 0 410 056 986  
 Governor  
 Governor design. : RSF315/2125M64-13  
 Governor no. : 0 420 021 128

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA ALDA

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

KD6

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 5.8...5.9

100 s : (5.7...6.0)

Spread cm<sup>3</sup> : 0.2

100 s : (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.6...5.9

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del. quantity : 58.0...59.0

1000 : (57.0...60.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever  
 position degrees: 50...0

3rd rack travel in: 6.5...6.9

Speed rpm : 2300

4th rack travel in: 2700

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,60...3,70  
: (3,50...3,80)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 2000  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.40...0.80

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.50...3.70  
2nd pressure hPa : 750  
Rack travel in m: 5.00...5.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 54.5...56.0  
1000 s: (53.5...57.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (48.0...52.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050

K07

Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 38.0...39.0  
1000 s: (37.0...40.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2300  
Rack travel in mm : 6.50...6.90  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (11,7...13,1)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2700  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

Start-of-delivery sensor system:

adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

Adjustment of the control-rod travel  
sensor

At a speed of 1000 1/min, set fuel  
delivery at 22.0...23.0 (21.0...24.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 1.633...1.639$  (1.635...1.637) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 2.472...  
2.532 V must be attained.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit  
KDEP-P400

Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 2.457...2.517  
(2.427...2.547) V must be displayed  
on the digital voltmeter.

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 44,5° max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 42,0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 29.10.92  
 Replaces : 01.09.92  
 Test oil : ISO-4113

Combination no. : 0 400 076 968

Injection pump  
 Pump designation : PES6M55C320RS178  
 EP type number : 0 410 056 986  
 Governor  
 Governor design. : RSF315/2125M64-13  
 Governor no. : 0 420 021 128

Cust. part no. : T4

Customer-spec. information  
 Customer : MB-PKW

Engine : OM603A D35 USA ALDA

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

K09

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 13.70...13.80

---

Del. quantity cm<sup>3</sup>/ : 5.8...5.9

---

100 s : (5.7...6.0)

---

Spread cm<sup>3</sup> : 0.2

---

100 s : (0.3)

---

2nd speed rpm : 290.0

Rack travel in mm : 5.6...5.9

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s : (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s : (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1850  
 Del. quantity : 58.0...59.0

1000 : (57.0...60.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0

3rd rack travel in: 6.5...6.9

Speed rpm : 2300

4th rack travel in: 2700

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER  
 POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1  
 Control lever



position degrees: 8...12  
Setting point w/out bumper spring  
Speed rpm : 290  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Speed rpm : 1000  
Maximum rack trave: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,60...4,10  
                  : (3,50...4,20)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 2000  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.40...0.80

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.50...3.70  
2nd pressure hPa : 750  
Rack travel in m: 5.00...5.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm<sup>3</sup>/ : 54.5...56.0  
                  1000 s: (53.5...57.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1850  
Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
                  1000 s: (48.0...52.0)

Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 38.0 ..39.0  
                  1000 s: (37.0...40.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2300  
Rack travel in mm : 6.50...6.90  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.60...5.90  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
                  1000 s: (5.0...9.5)  
Spread cm<sup>3</sup> : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

#### Control lever at idle stop

Speed rpm : 315  
Rack travel in mm : (11,7...13,1)  
Del.quantity cm<sup>3</sup>/ : -  
                  1000 s: (41,0...49,0)  
Current A : 1,8

#### Control lever at full-load stop

Speed rpm : 2700  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 1,8A

Remarks:

:  
Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### \* RWG testing and adjustment with evaluation circuit KDEP-P400

##### incoming inspection

Position control lever against  
full-load stop. Set 13.5 V on  
regulator. Apply 1850 nPa to ALDA.  
Approach engine speed of 1000 1/min;  
in doing so, digital voltmeter must  
indicate a voltage of 2.432...2.502  
(2.462...2.482) V.

##### RWG adjustment

At engine speed of 1000 1/min  
set delivery rate of 22.0...23.0  
(21.0...24.0) ccm/1000 strokes  
with control lever. Shift RWG until  
 $U = 1.633...1.639$  (1.635...1.637) V  
is indicated. Tighten fastening  
screws to 1...2 Nm. Move control  
lever to full-load stop; voltage  
value of 2.432...2.502 V must be  
attained.

Sliding sleeve pre-travel = 5.5 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 42,0°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.

At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE  
 Edition : 26.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 411  
 Injection pump  
 Pump designation : PES6A100D410RS2762-1  
 EP type number : 0 410 806 008  
 Governor  
 Governor design. : RSV425...1100AOC2252  
 -2L  
 Governor no. : 0 420 232 591

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076ADW-30

1st version kW : 135.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00x2.00x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Presroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del. quantity cm<sup>3</sup>/ : 10.4...10.6

100 s: (10.2...10.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 425.0  
 Rack travel in mm : 6.0...6.2  
 Del. quantity cm<sup>3</sup>/ : 3.1...3.5  
 100 s: (2.9...3.7)

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del. quantity : 104.5...106.5  
 1000 : (102.5...108.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 45...53

Testing:

1st rack travel in: 10.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 6.00...6.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 700  
Rack travel in m: 13.50...13.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 141.0...145.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0  
1000 s: (95.0...125.0)

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 31.0...35.0  
1000 s: (29.0...37.0)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE55529  
Start-of-delivery mark = 13,5° after  
start of delivery cyl. 1.

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 v  
 Edition : 27.05.91  
 Replaces : 06.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 738  
 Injection pump  
 Pump designation : PES6P120A720/3LS3254  
 EP type number : 0 412 026 739  
 Governor  
 Governor design. : RQV300...950PA959  
 Governor no. : 0 421 813 860

Customer-spec. information  
 Customer : MAN

Engine : D2866LFD2  
 1st version kW : 250.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 15.00...15.10  
 Del.quantity cm<sup>3</sup>/ : 24.2...24.4  
 100 s: (23.9...24.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
 travel mm : 9.70...9.90  
 2nd speed rpm : 300  
 travel mm : 0.90...1.10  
 3rd speed rpm : 500  
 travel mm : 3.40...4.00  
 4th speed rpm : 750  
 travel mm : 6.60...7.00  
 5th speed rpm : 1250  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1025  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200

Del. quantity : 242.0...244.0  
1000 : (239.0...247.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 298...306

#### Testing:

1st rack travel in: 13.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 254...262

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.40  
Speed rpm : 300  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 320...430

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.70...14.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 228.0...234.0  
1000 s: (225.0...237.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 215.0...235.0  
1000 s: (211.0...239.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...5.10  
Del. quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7942

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h2  
 Edition : 26.02.93  
 Replaces : 02.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 839  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125T  
 EP type number : 0 412 628 824  
 Governor  
 Governor design. : RGV200...950PA736-1  
 Governor no. : 0 421 813 551

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC14 03

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm<sup>3</sup>/ : 22.1...22.3  
 100 s : (21.8...22.6)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 995  
 travel mm : 7.70...7.90  
 5th speed rpm : 1125  
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 221.0...223.0  
 1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 91...99

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 40...48

Testing:  
Speed rpm : 125  
Minimum rack travel: 6.00  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 211.0...219.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 m1  
 Edition : 26.02.93  
 Replaces : 02.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 868  
 Injection pump  
 Pump designation : PE8P120A920/4LS7180  
 EP type number : 0 412 628 837  
 Governor  
 Governor design. : RQV350...1050PA795-8  
 Governor no. : 0 421 813 770

Customer-spec. information  
 Customer : SCANIA

Engine : DSI 14

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 26.8...27.0  
 100 s: (26.5...27.3)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.0)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350  
 travel mm : 1.30...1.70  
 3rd speed rpm : 650  
 travel mm : 4.10...4.70  
 4th speed rpm : 1145  
 travel mm : 7.80...8.00  
 5th speed rpm : 1255  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1325  
 Rack travel in mm : 6.00...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 268.0...270.0  
 1000 : (265.0...273.0)  
 Spread cm<sup>3</sup> : 7.00  
 1000 : (10.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 250  
Minimum rack travel: 6.00  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...10.10  
2nd pressure hPa : 365  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 215  
Rack travel in m: 10.80...11.00

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 258.0...266.0  
1000 s: (256.0...268.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...150.0  
1000 s: (-)  
Rack travel in mm : 9.70...10.10

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 o  
 Edition : 26.02.93  
 Replaces : 10.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 891

Injection pump  
 Pump designation : PE8P120A920/4LS7189Q  
 EP type number : 0 412 628 858  
 Governor  
 Governor design. : RQV200...950PA736-8  
 Governor no. : 0 421 813 315

Customer-spec. information  
 Customer : SCANIA

Engine : DSC14 08

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 2.30

Overflow  
 quantity min. 1/h: 170...0

Test nozzle holder  
 assembly : 1 688 901 104

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.30...12.40

---

Del. quantity cm<sup>3</sup>/ : 21.9...22.1  
 100 s: (21.6...22.4)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

---

2nd speed rpm : 250.0  
 Rack travel in mm : 4.4...4.8  
 Del. quantity cm<sup>3</sup>/ : 1.2...1.6  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.40...1.80  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 995  
 travel mm : 7.70...7.90  
 5th speed rpm : 1115  
 travel mm : 9.20...9.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 900  
Del. quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 11.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 41...49

Testing:  
Speed rpm : 150  
Minimum rack travel: 5.80  
Speed rpm : 250  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 375...435

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 525  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 320  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 202.0...210.0  
1000 s: (200.0...212.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...180.0  
1000 s: (-)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 08.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 895X

Injection pump  
 Pump designation : PE8P120A320LS7835-10  
 EP type number : 0 412 628 853  
 Governor  
 Governor design. : RQ300/1050PA972-1  
 Governor no. : 0 421 801 545

Cust. part no. : 0180742102

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.70...1.90

2nd speed rpm : 510  
 travel mm : 5.90...6.10

3rd speed rpm : 845  
 travel mm : 6.30...6.50

4th speed rpm : 1109  
 travel mm : 6.70...6.90

5th speed rpm : 1270  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750  
Aneroid pressure h: 1200  
Del. quantity : 230.0...232.0  
1000 : (227.0...235.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 600  
Rack travel in m: 13.50...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm3/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 40.0...70.0  
1000 s: (36.0...74.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 17,2 f  
 Edition : 01.03.93  
 Replaces : 01.93  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 912  
 Injection pump  
 Pump designation : PE8P130A920/5LS7841  
 EP type number : 0 412 638 803  
 Governor  
 Governor design. : RQV300...950PA994K  
 Governor no. : 0 421 815 275

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.050

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 11.50...12.50

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.50...12.50  
 & maximum rack tra: 21.00

Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 300.0

Rack travel in mm : 4.0...4.4

Del. quantity cm<sup>3</sup>/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995

travel mm : 9.60...9.80

2nd speed rpm : 300

travel mm : 2.50...2.70

3rd speed rpm : 500

travel mm : 4.10...4.70

4th speed rpm : 700

travel mm : 5.90...6.50

5th speed rpm : 1250

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 8.10...10.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 900  
Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.40  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

CONSTANT REGULATION  
Speed rpm : 170...290

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 950  
Rack travel in m: 10.40...10.60  
3rd speed rpm : 700  
Rack travel in m: 10.40...10.70  
4th speed rpm : 350  
Rack travel in m: 10.00...10.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 7.30...7.50  
2nd pressure hPa : 360  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 260  
Rack travel in m: 8.10...8.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm3/ : 214.0...220.0  
1000 s: (211.0...223.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 139.0...141.0  
1000 s: (136.0...144.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 9.40  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.00...4.40  
Del.quantity cm3/ : 22.0...28.0  
1000 s: (19.0...31.0)  
Spread cm3 : 5.00  
1000 s: (9.00)

Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA  
 Edition : 01.03.93  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 913  
 Injection pump  
 Pump designation : PE8P130A920/5LS7841  
 EP type number : 0 412 638 803  
 Governor  
 Governor design. : RGV250...950PA994-1K  
 Governor no. : 0 421 815 276

Customer-spec. information  
 Customer : IVECO-FIAT  
 Engine : 8280.42.350 SPR

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 11.50...12.50

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.50...12.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 550  


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 Rack travel in mm : 10.90...11.00  


---

 Del.quantity cm<sup>3</sup>/ : 22.1...22.3  
 100 s: (21.8...22.6)  


---

 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)  


---

 2nd speed rpm : 300.0  
 Rack travel in mm : 4.0...4.4  
 Del.quantity cm<sup>3</sup>/ : 2.2...2.8  
 100 s: (1.9...3.1)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995  
 travel mm : 9.60...9.80  
 2nd speed rpm : 300  
 travel mm : 2.50...2.70  
 3rd speed rpm : 500  
 travel mm : 4.10...4.70  
 4th speed rpm : 700  
 travel mm : 5.90...6.50  
 5th speed rpm : 1250  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1070  
 Rack travel in mm : 9.10...11.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h : 900  
Del.quantity : 221.0...223.0  
1000 : (218.0...226.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 10.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.70  
Speed rpm : 300  
Rack travel in mm : 4.10...4.30

CONSTANT REGULATION  
Speed rpm : 170...290

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 950  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 700  
Rack travel in m: 11.30...11.60  
4th speed rpm : 400  
Rack travel in m: 10.50...10.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 950  
Pressure hPa : 900  
Rack travel mm : 11.60...11.80

Measurement  
Speed 1/min : 950

1st pressure hPa : -  
Rack travel in m: 7.80...8.00  
2nd pressure hPa : 450  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 280  
Rack travel in m: 8.70...9.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 247.0...254.0  
1000 s: (244.0...257.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 147.0...149.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...180.0  
1000 s: (146.0...184.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.00...4.40  
Del.quantity cm<sup>3</sup>/ : 22.0...28.0  
1000 s: (19.0...31.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 08.92  
 Test oil : ISO-4113

Combination no. : 0 402 648 914X

Injection pump  
 Pump designation : PE8P120A320LS7835-10  
 EP type number : 0 412 628 853  
 Governor  
 Governor design. : RQV300...1050PA797  
 -30  
 Governor no. : 0 421 813 921

Cust. part no. : 0180742202

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kw : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Firing order : 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

---

Rack travel in mm : 14.60...14.80

---

Del.quantity cm<sup>3</sup>/ : 23.0...23.2

---

100 s: (22.7...23.5)

---

Spread cm<sup>3</sup> : 0.6

---

100 s: (0.9)

---

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 608  
 travel mm : 4.80...5.30

3rd speed rpm : 820  
 travel mm : 5.90...6.40

4th speed rpm : 1108  
 travel mm : 8.10...8.60

5th speed rpm : 1190  
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION  
 Control-lever position

Degree: -1  
Speed rpm : 1130  
Rack travel in mm : 12.60...15.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750  
Aneroid pressure h: 1200  
Del. quantity : 230.0...232.0  
1000 : (227.0...235.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500

L01

1st pressure hPa : 250  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...230.0  
1000 s: (196.0...234.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 915X  
 Injection pump  
 Pump designation : PE8P120A32OLS7835-10  
 EP type number : 0 412 628 853  
 Governor  
 Governor design. : RQ300/1050PA993-1  
 Governor no. : 0 421 801 582

Cust. part no. : 0200747202

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.60...14.80

Del. quantity cm<sup>3</sup>/ : 23.0...23.2  
 100 s: (22.7...23.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Aneroid pressure h: 1200  
 Del. quantity : 230.0...232.0  
 1000 : (227.0...235.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 13.90...14.10  
3rd speed rpm : 800  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 600  
Rack travel in m: 13.50...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 214.0...217.0  
1000 s: (211.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...230.0  
1000 s: (196.0...234.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 929A  
 Injection pump  
 Pump designation : PE8P120A32OLS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQV300...950PA1033-1  
 Governor no. : 0 421 813 991

Cust. part no. : 0230741402

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

L04

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.40...13.50  
 Del. quantity cm<sup>3</sup>/ : 23.3...23.5  
 100 s : (23.0...23.8)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s : (0.7...1.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 300  
 travel mm : 1.10...1.50  
 2nd speed rpm : 567  
 travel mm : 4.40...5.00  
 3rd speed rpm : 780  
 travel mm : 6.00...6.60  
 4th speed rpm : 1010  
 travel mm : 8.50...8.70  
 5th speed rpm : 1190  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1080  
 Rack travel in mm : 10.70...13.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1200  
Del. quantity : 233.0...235.0  
1000 : (230.0...238.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1170  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 300...450

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...13.00  
2nd speed rpm : 800  
Rack travel in m: 13.40...13.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 650  
Rack travel in m: 12.40...12.60

L05

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 206.0...209.0  
1000 s: (203.0...212.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 250.0...290.0  
1000 s: (246.0...294.0)

Remarks:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 01.93  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 930  
 Injection pump  
 Pump designation : PE8P120A320LS7847  
 EP type number : 0 412 628 863  
 Governor  
 Governor design. : RQ300/1050PA1031-2  
 Governor no. : 0 421 801 645

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.40...13.50  
 Del. quantity cm<sup>3</sup>/ : 23.3...23.5  
 100 s: (23.0...23.8)

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.2...5.8  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del. quantity : 233.0...235.0  
 1000 : (230.0...238.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 800  
Rack travel in m: 13.40...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.60

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 650  
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

L07

Speed rpm : 1050  
Del.quantity cm3/ : 206.0...209.0  
1000 s: (203.0...212.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...290.0  
1000 s: (246.0...294.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA  
 Edition : 26.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 943  
 Injection pump  
 Pump designation : PE8P120A920/4LS7189  
 EP type number : 0 412 628 840  
 Governor  
 Governor design. : RQV350...1050PA795  
 -14  
 Governor no. : 0 421 814 020

Customer-spec. information  
 Customer : SCANIA

Engine : D5C14

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 2.30

Overflow  
 quantity min. 1/h: 170...0

Test nozzle holder  
 assembly : 1 688 901 104

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

L08

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 Phasing : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.9

Del.quantity cm<sup>3</sup>/ : 1.8...2.4

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350

travel mm : 1.30...1.70

3rd speed rpm : 650

travel mm : 4.10...4.70

4th speed rpm : 1095

travel mm : 7.80...8.00

5th speed rpm : 1215

travel mm : 9.10...9.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 215.0...217.0  
1000 : (212.0...220.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.50  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 375...435

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 525  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 320  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 195.0...203.0  
1000 s: (193.0...205.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (-)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 05.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 948A  
 Injection pump  
 Pump designation : PE8P120A320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQ300/1050PA1030-7  
 Governor no. : 0 421 801 669

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 294.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.70...12.80

Del. quantity cm<sup>3</sup>/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1000

Del. quantity : 206.0...208.0

1000 : (203.0...211.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 550  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 203.0...207.0  
1000 s: (200.0...210.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

L11

1st version:  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...95.0  
1000 s: (61.0...99.0)  
Rack travel in mm : 9.40...9.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 951  
 Injection pump  
 Pump designation : PE8P120A320LS7840-1  
 EP type number : 0 412 628 862  
 Governor  
 Governor design. : RQV350...1050PA1053  
 Governor no. : 0 421 814 038

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 80...100

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del. quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.00...1.50

2nd speed rpm : 453  
 travel mm : 2.30...2.80

3rd speed rpm : 770  
 travel mm : 4.70...5.20

4th speed rpm : 1108  
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1180

Rack travel in mm : 10.40...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
Aneroid pressure h: 1200  
Del. quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 11.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78

#### Testing:

Speed rpm : 250  
Minimum rack travel: 9.90  
Speed rpm : 350  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 380...500

#### TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 1030  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 825  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 700

Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1030  
Del. quantity cm<sup>3</sup>/ : 192.0...196.0  
1000 s: (189.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 1030  
Del. quantity cm<sup>3</sup>/ : 143.0...147.0 \*  
1000 s: (140.0...150.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

\* = Set at reduced-delivery stop.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 26.02.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 952  
 Injection pump  
 Pump designation : PE8P120A320LS7856  
 EP type number : 0 412 628 867  
 Governor  
 Governor design. : RQV350...1050PA1051  
 -1  
 Governor no. : 0 421 814 039

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 60...80  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1  
 Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 23.8...24.0  
 100 s: (23.5...24.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.00...1.50  
 2nd speed rpm : 453  
 travel mm : 2.30...2.80  
 3rd speed rpm : 770  
 travel mm : 4.70...5.20  
 4th speed rpm : 1108  
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1170  
 Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del. quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 250  
Minimum rack trave: 7.80  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 350...450

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 1050  
Rack travel in m: 12.90...13.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...10.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 600  
Rack travel in m: 11.70...11.90

L15

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 166.0...170.0 \*  
1000 s: (163.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1080...1090

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 05.02.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 676 814  
 Injection pump  
 Pump designation : PE6P120A320LS7861  
 EP type number : 0 412 626 876  
 Governor  
 Governor design. : RSV350...1050POA535  
 -7  
 Governor no. : 0 421 833 386

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 401 LA

1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del. quantity cm<sup>3</sup>/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.8...5.4

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del. quantity : 205.0...207.0

1000 : (202.0...210.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1145...1163  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.80...5.40  
Rack travel in mm : 2.00  
Speed rpm : 370...430

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.50

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 450  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del. quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

:  
Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 6  
 Edition : 26.02.93  
 Replaces : 05.92  
 Test oil : ISO-4113

Combination no. : 0 402 736 812

Injection pump  
 Pump designation : PES6P110A12ORS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1200PA964  
 -4K  
 Governor no. : 0 421 815 256

Customer-spec. information  
 Customer : CDC

Engine : 6CTA-A

1st version kw : 156.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 14.7...14.9

100 s: (14.4...15.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1260

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 1200  
Del.quantity : 147.5...149.5  
1000 : (144.5...152.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 650  
Rack travel in m: 10.90...11.30  
3rd speed rpm : 550  
Rack travel in m: 10.80...11.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 1200

1st pressure hPa : -

Rack travel in m: 7.70...8.10  
2nd pressure hPa : 225  
Rack travel in m: 8.90...9.00  
3rd pressure hPa : 575  
Rack travel in m: 11.20...11.60

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 151.0...157.0  
1000 s: (148.0...160.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 86.5...90.5  
1000 s: (84.5...92.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3921774

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 26.02.93  
 Replaces : 02.93  
 Test oil : ISO-4113

Combination no. : 0 402 736 823

Injection pump  
 Pump designation : PES6P110A120RS7249  
 EP type number : 0 412 716 807  
 Governor  
 Governor design. : RQV350...1150PA964  
 -9K  
 Governor no. : 0 421 815 295

Customer-spec. information  
 Customer : CDC

Engine : 6CTA-A

1st version kW : 187.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 115...125

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del. quantity cm<sup>3</sup>/ : 17.8...18.0

100 s: (17.5...18.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.70...2.10

2nd speed rpm : 450  
 travel mm : 3.10...3.50

3rd speed rpm : 700  
 travel mm : 5.90...6.30

4th speed rpm : 1200  
 travel mm : 9.00...9.20

5th speed rpm : 1400  
 travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 1200  
 Del. quantity : 178.0...180.0  
 1000 : (175.0...183.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1200...1210  
2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 350...500

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 650  
Rack travel in m: 11.60...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.30...14.40

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 7.90...8.30  
2nd pressure hPa : 320  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 860  
Rack travel in m: 13.20...13.60

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 165.5...171.5  
1000 s: (162.5...174.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 92.5...96.5  
1000 s: (90.5...98.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1200...1210

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.90...11.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 23.5...29.5  
1000 s: (21.5...31.5)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (11.00)

Remarks: : C.D.C. # 3921970

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 01.03.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 831  
 Injection pump  
 Pump designation : PES6P120A12ORS7261  
 EP type number : 0 412 726 876  
 Governor  
 Governor design. : RQV350...1100PA924  
 -8K  
 Governor no. : 0 421 815 318

Customer-spec. information  
 Customer : CUMMINS

Engine : 6CTAA

1st version kw : 176.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.10...1.50

2nd speed rpm : 550  
 travel mm : 3.40...4.00

3rd speed rpm : 900  
 travel mm : 6.10...6.70

4th speed rpm : 1150  
 travel mm : 8.40...8.60

5th speed rpm : 1250  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1400

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 144.0...146.0  
1000 : (141.0...149.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

#### Testing:

1st rack travel in: 9.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...74

#### Testing:

Speed rpm : 250  
Minimum rack travel: 6.30  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 350...450

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 700  
Rack travel in m: 9.90...10.10  
3rd speed rpm : 900  
Rack travel in m: 10.20...10.50  
4th speed rpm : 400  
Rack travel in m: 9.00...9.30

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 900  
Rack travel mm : 10.80...10.90

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.40...7.60  
2nd pressure hPa : 560

L24

Rack travel in m: 10.20...10.30  
3rd pressure hPa : 320  
Rack travel in m: 8.40...8.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 151.0...157.0  
1000 s: (148.0...160.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 105.0...109.0  
1000 s: (103.0...111.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...280.0  
1000 s: (246.0...284.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (21.0...31.0)  
Spread cm3 : 7.00  
1000 s: (11.00)

#### Remarks:

: C.D.C. # 3281841  
Start-of-delivery mark is at 7° after  
start of delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 08.03.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 834  
 Injection pump  
 Pump designation : PES6P120A120RS7265  
 EP type number : 0 412 726 882  
 Governor  
 Governor design. : RQV350...1100PA964  
 -12K  
 Governor no. : 0 421 815 323

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 186.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
 Prestroke mm : 3.95...4.05  
 : (3.90...4.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.7...6.9

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 2.10...2.40

2nd speed rpm : 450

travel mm : 3.20...3.60

3rd speed rpm : 900

travel mm : 5.60...6.00

4th speed rpm : 1200

travel mm : 8.10...8.30

5th speed rpm : 1400

travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid' pressure h: 1200

Del.quantity : 207.5...209.5

1000 : (204.5...212.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 12.50  
Speed rpm : 1250...1280  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 13...21

#### Testing:

Speed rpm : 275  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.70...6.90

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 650  
Rack travel in m: 11.90...12.30  
3rd speed rpm : 1200  
Rack travel in m: 13.50...13.70  
4th speed rpm : 750  
Rack travel in m: 12.20...12.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 9.20...9.60  
2nd pressure hPa : 230  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 545

L26

Rack travel in m: 12.50...12.90

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 158.5...164.5  
1000 s: (155.5...167.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 171.5...177.5  
1000 s: (168.5...190.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 59.5...63.5  
1000 s: (57.5...65.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1250...1280

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.70...6.90  
Del. quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3922471

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 26.02.93  
 Replaces : 12.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 836  
 Injection pump  
 Pump designation : PES6P120A120RS7265  
 EP type number : 0 412 726 882  
 Governor  
 Governor design. : RQV350...1000PA964  
 -14K  
 Governor no. : 0 421 815 325

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : D 403 510 253

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...110

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
 : (3.90...4.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 14.50...14.60  
 Del.quantity cm<sup>3</sup>/ : 23.8...24.0  
 100 s: (23.5...24.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.4  
 100 s: (1.6...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 600  
 travel mm : 5.10...5.50  
 4th speed rpm : 1000  
 travel mm : 8.10...8.30  
 5th speed rpm : 1200  
 travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1200  
 Del.quantity : 238.0...240.0  
 1000 : (235.0...243.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1140...1170  
2nd rack travel in: 4.00  
Speed rpm : 1295...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 12...20

#### Testing:

Speed rpm : 275  
Minimum rack travel: 8.10  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 13.15...13.55  
3rd speed rpm : 1100  
Rack travel in m: 14.30...14.50  
4th speed rpm : 750  
Rack travel in m: 13.40...13.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

#### Measurement

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 310  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 650

Rack travel in m: 13.20...13.60

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 211.5...217.5  
1000 s: (208.5...220.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 90.5...94.5  
1000 s: (88.5...96.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1140...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del. quantity cm<sup>3</sup>/ : 18.0...24.0  
1000 s: (16.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3922427

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 9,5 i  
 Edition : 18.12.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 901  
 Injection pump  
 Pump designation : PES6P120A720RS7224  
 EP type number : G 412 726 840  
 Governor  
 Governor design. : RQV275...1100PA975K  
 Governor no. : 0 421 815 266

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.406

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

M01

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 12.70...12.80  
 Del. quantity cm<sup>3</sup>/ : 21.7...21.9  
 100 s: (21.4...22.2)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 5.0...5.4  
 Del. quantity cm<sup>3</sup>/ : 2.3...2.9  
 100 s: (2.0...3.2)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1145  
 travel mm : 10.30...10.50  
 2nd speed rpm : 275  
 travel mm : 1.30...1.50  
 3rd speed rpm : 450  
 travel mm : 3.40...4.00  
 4th speed rpm : 750  
 travel mm : 5.90...6.30  
 5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1140  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del. quantity : 217.0...219.0  
 1000 : (214.0...222.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 270...400

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 900  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 700  
Rack travel in m: 12.00...12.20  
4th speed rpm : 500  
Rack travel in m: 11.50...11.70  
5th speed rpm : 350  
Rack travel in m: 11.00...11.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 7.40...7.60  
2nd pressure hPa : 750

M02

Rack travel in m: 11.30...11.40  
3rd pressure hPa : 410  
Rack travel in m: 8.60...9.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 227.0...233.0  
1000 s: (224.0...236.0)  
Aneroid pressure h: 1200  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 11.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (121.0...159.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.40  
Del. quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI  
 Edition : 22.01.93  
 Replaces : 04.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 931  
 Injection pump  
 Pump designation : PES6P120A32ORS7236  
 EP type number : 0 412 726 848  
 Governor  
 Governor design. : RQV275...1000PA1001  
 -2  
 Governor no. : 0 421 813 989

Customer-spec. information  
 Customer : RVI

Engine : MIDR 063540 N/3

1st version kw : 283.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 18.00...21.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.20...13.30  
 Del. quantity cm<sup>3</sup>/ : 28.2...28.4  
 100 s: (27.9...28.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm<sup>3</sup>/ : 2.8...3.2  
 100 s: (2.5...3.5)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1080  
 travel mm : 8.40...8.60  
 2nd speed rpm : 275  
 travel mm : 1.20...1.40  
 3rd speed rpm : 490  
 travel mm : 3.50...4.10  
 4th speed rpm : 775  
 travel mm : 5.90...6.30  
 5th speed rpm : 1450  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1190  
 Rack travel in mm : 11.90...14.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000

Del.quantity : 282.0...284.0  
1000 : (279.0...287.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 297...305

#### Testing:

1st rack travel in: 12.20  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 243...251

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 310...420

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.20...13.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.50  
2nd pressure hPa : 480  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 240  
Rack travel in m: 10.10...10.50

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

M04

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 260.0...266.0  
1000 s: (257.0...269.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 159.0...161.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...175.0  
1000 s: (141.0...179.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.0...35.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI  
 Edition : 26.02.93  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 935

Injection pump  
 Pump designation : PES6P120A32ORS7267  
 EP type number : 0 412 726 883  
 Governor  
 Governor design. : RGV275...1000PA1001  
 -3

Governer no. : 0 421 814 025

Customer-spec. information  
 Customer : RVI

Engine : MIDR 063540 J/31

1st version kw : 314.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 10.50...11.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600  


---

 Rack travel in mm : 12.10...12.20  


---

 Del.quantity cm3/ : 30.9...31.1  


---

 100 s: (30.6...31.4)  


---

 Spread cm3 : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.5...5.7  
 Del.quantity cm3/ : 3.7...4.1  
 100 s: (3.4...4.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1080  
 travel mm : 8.00...8.20  
 2nd speed rpm : 275  
 travel mm : 1.10...1.40  
 3rd speed rpm : 500  
 travel mm : 3.50...4.10  
 4th speed rpm : 800  
 travel mm : 5.80...6.20  
 5th speed rpm : 1400  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1235  
 Rack travel in mm : 10.80...13.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000

Del.quantity : 309.0...311.0  
1000 : (306.0...314.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

#### Testing:

1st rack travel in: 11.10  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 246...254

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 260...380

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.10...12.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 400  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 160  
Rack travel in m: 9.30...9.60

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

MD6

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 292.0...298.0  
1000 s: (289.0...301.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 161.0...163.0  
1000 s: (158.0...166.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.90  
Del.quantity cm3/ : 37.0...41.0  
1000 s: (34.0...44.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI  
 Edition : 18.12.92  
 Replaces : 11.92  
 Test oil : ISC-4113  
 Combination no. : 0 402 746 937  
 Injection pump  
 Pump designation : PES6P120A720RS7268  
 EP type number : 0 412 726 884  
 Governor  
 Governor design. : RQ275/1100PA915-2  
 Governor no. : 0 421 801 671

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.603

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 11.50...11.60  
 Del.quantity cm<sup>3</sup>/ : 18.3...18.5  
 100 s : (18.0...18.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 5.0...5.4  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s : (1.7...2.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900  
 Del.quantity : 183.0...185.0  
 1000 : (180.0...188.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 10.50  
 Speed rpm : 1145...1160  
 2nd rack travel in: 4.00  
 Speed rpm : 1230...1260

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.70  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 325...365

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 550  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.60...8.80  
2nd pressure hPa : 310  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 240  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 197.0...203.0  
1000 s: (194.0...206.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 104.0...106.0  
1000 s: (101.0...109.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...145.0  
1000 s: (111.0...149.0)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI  
 Edition : 26.02.93  
 Replaces : 11.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 938  
 Injection pump  
 Pump designation : PES6P120A72ORS7269  
 EP type number : 0 412 726 885  
 Governor  
 Governor design. : RQ310/1025PA872-1  
 Governor no. : 0 421 801 672

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.21.313

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 12.00...13.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.40...5.60  
 & maximum rack tra: 12.0...13.0  
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 1025  
 Rack travel in mm : 12.60...12.70  
 Del. quantity cm<sup>3</sup>/ : 19.2...19.4  
 100 s: (18.9...19.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 310.0  
 Rack travel in mm : 5.7...6.1  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.7...2.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1025  
 Aneroid pressure h: 900  
 Del. quantity : 192.0...194.0  
 1000 : (189.0...197.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60  
Speed rpm : 1070...1085  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 310  
Rack travel in mm : 5.8

Testing:

Speed rpm : 100  
Minimum rack travel: 7.30  
Speed rpm : 310  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 425...465

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1025  
Rack travel in m: 13.10...13.20  
4th speed rpm : 650  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 310  
Rack travel in m: 11.90...12.00  
3rd pressure hPa : 240  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 212.0...218.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 123.0...125.0  
1000 s: (120.0...128.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1070...1085

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 105.0...135.0  
1000 s: (101.0...139.0)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 940  
 Injection pump  
 Pump designation : PES6P110A320LS7277  
 EP type number : 0 412 716 809  
 Governor  
 Governor design. : RQV350...1000PA1054K  
 Governor no. : 0 421 815 337

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA-531

1st version kW : 224.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 076

Inlet press., bar : 2.80

Overflow  
 quantity min. 1/h: 170...190

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.85...2.95  
 : (2.80...3.00)  
 Rack travel in mm : 14.00...17.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 14.80...14.90

Del. quantity cm<sup>3</sup>/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del. quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.40...1.60

2nd speed rpm : 500  
 travel mm : 3.50...3.90

3rd speed rpm : 800  
 travel mm : 6.80...7.20

4th speed rpm : 1000  
 travel mm : 8.90...9.10

5th speed rpm : 1200  
 travel mm : 11.50...11.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 650  
 Aneroid pressure h: 1500  
 Del. quantity : 234.5...236.5  
 1000 : (231.5...239.5)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 14.10  
Speed rpm : 1040...1070  
2nd rack travel in: 4.00  
Speed rpm : 1170...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 15...23

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 650  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 1000  
Rack travel in m: 15.10...15.30  
3rd speed rpm : 500  
Rack travel in m: 13.40...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1500  
Rack travel mm : 15.10...15.30

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.10...9.40  
2nd pressure hPa : 390  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 950  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 211.5...217.5  
1000 s: (208.5...220.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 83.5...87.5  
1000 s: (81.5...89.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 1040...1070

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (135.0...185.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (6.50)

#### Remarks:

: NAVISTAR #1815915C91  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Delivery-valve spring pre-tension =  
6.00...6.10 mm.  
Permissible alteration from 5.70...6.30  
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI  
 Edition : 05.02.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 942  
 Injection pump  
 Pump designation : PES6P120A72CRS7224-1  
 EP type number : 0 412 726 889  
 Governor  
 Governor design. : RQ275/1050PA1021-2  
 Governor no. : 0 421 801 676

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.721

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

M13

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 10.80...10.90  
 Del. quantity cm<sup>3</sup>/ : 18.8...19.0  
 100 s: (18.5...19.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 4.8...5.2  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.7...2.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 900  
 Del. quantity : 188.0...190.0  
 1000 : (185.0...193.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 9.80  
 Speed rpm : 1095...1110  
 2nd rack travel in: 4.00  
 Speed rpm : 1170...1200

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 335...375

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 550  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 850  
Pressure hPa : 900  
Rack travel mm : 10.80...10.90

#### Measurement

Speed 1/min : 850

1st pressure hPa : -  
Rack travel in m: 7.30...7.50  
2nd pressure hPa : 430  
Rack travel in m: 9.90...10.00  
3rd pressure hPa : 250  
Rack travel in m: 8.20...8.40

#### START CUT-OUT

Speed 1/min : 215 (235)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 218.0...224.0  
1000 s: (215.0...227.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 126.0...128.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...160.0  
1000 s: (126.0...164.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI  
 Edition : 01.03.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 943  
 Injection pump  
 Pump designation : PES6P120A720RS7224-1  
 EP type number : 0 412 726 889  
 Governor  
 Governor design. : RQ275/1050PA1021-3  
 Governor no. : 0 421 801 677

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.41.731

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 105  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

M15

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 12.70...12.80  
 Del.quantity cm3/ : 22.2...22.4  
 100 s : (21.9...22.7)  
 Spread cm3 : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 4.8...5.2  
 Del.quantity cm3/ : 2.0...2.6  
 100 s : (1.7...2.9)  
 Spread cm3 : 0.8  
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1200  
 Del.quantity : 222.0...224.0  
 1000 : (219.0...227.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0  
 Testing:  
 1st rack travel in: 11.70  
 Speed rpm : 1095...1110  
 2nd rack travel in: 4.00  
 Speed rpm : 1190...1220

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 335...375

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 550  
Rack travel in m: 13.20...13.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 850  
Pressure hPa : 1200  
Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 850

1st pressure hPa : -  
Rack travel in m: 7.50...7.70  
2nd pressure hPa : 580  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 290  
Rack travel in m: 8.60...9.00

START CUT-OUT

Speed 1/min : 215 (235)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 550  
Del.quantity cm<sup>3</sup>/ : 266.0...274.0  
1000 s: (263.0...277.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 126.0...128.0  
1000 s: (123.0...131.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...160.0  
1000 s: (126.0...164.0)

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 944

Injection pump  
 Pump designation : PES6P120A320RS7267  
 EP type number : 0 412 726 883  
 Governor  
 Governor design. : RQV275...1000PA1001  
 -4

Governer no. : 0 421 814 045

Customer-spec. information

Customer : RVI

Engine : MIDR 063540 N/31

1st version kW : 283.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 10.50...11.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 28.2...28.3

100 s: (27.9...28.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.1

Del.quantity cm<sup>3</sup>/ : 3.1...3.5

100 s: (2.8...3.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1080  
 travel mm : 8.00...8.20

2nd speed rpm : 275  
 travel mm : 1.10...1.30

3rd speed rpm : 500  
 travel mm : 3.50...4.10

4th speed rpm : 800  
 travel mm : 5.80...6.20

5th speed rpm : 1400  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1235

Rack travel in mm : 9.70...13.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 282.0...283.0  
1000 : (279.0...286.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 296...304

#### Testing:

1st rack travel in: 10.70  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 244...252

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 260...380

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 320  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 160  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

M18

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 264.0...270.0  
1000 s: (261.0...273.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...160.0  
1000 s: (155.0...163.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...170.0  
1000 s: (136.0...174.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : -5.60...-6.00  
Del.quantity cm<sup>3</sup>/ : 31.0...35.0  
1000 s: (28.0...38.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

:  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 7,1 h  
 Edition : 18.12.92  
 Replaces : 12.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 846 052  
 Injection pump  
 Pump designation : PE6P110A32ORS8009-1  
 EP type number : 0 412 816 011  
 Governor  
 Governor design. : RQV300...1100PA1017  
 Governor no. : 0 421 813 965

Customer-spec. information  
 Customer : VME

Engine : TD73KBE

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 078  
 Inlet press., bar : 2.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.80...3.90  
 : (3.75...3.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 10.00...10.10  
 Del.quantity cm<sup>3</sup>/ : 16.4...16.6  
 100 s : (16.2...16.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.2...4.6  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s : (1.8...2.8)  
 Spread cm<sup>3</sup> : 0.7  
 100 s : (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.90...1.30  
 2nd speed rpm : 500  
 travel mm : 2.60...3.20  
 3rd speed rpm : 800  
 travel mm : 4.90...5.50  
 4th speed rpm : 1150  
 travel mm : 8.20...8.40  
 5th speed rpm : 1300  
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1160  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 164.0...166.0  
 1000 : (162.0...168.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 102...110

#### Testing:

1st rack travel in: 9.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.90  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

#### CONSTANT REGULATION

Speed rpm : 300...370

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 10.00...10.10

##### Measurement

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 7.60...7.80  
2nd pressure hPa : 90  
Rack travel in m: 7.80...7.90  
3rd pressure hPa : 375  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm3/ : 116.0...118.0  
1000 s: (113.0...121.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1140...1150

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN  
 Edition : 18.12.92  
 Replaces : 10.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 846 054  
 Injection pump  
 Pump designation : PE6P12DA32ORS8017  
 EP type number : 0 412 826 018  
 Governor  
 Governor design. : RQV300...1100PA1017  
 -1  
 Governor no. : 0 421 814 023

Customer-spec. information  
 Customer : PENTA

Engine : TWD 1030 ME  
 1st version kw : 212.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 078

Inlet press., bar : 2.50

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20  
 : (4.05...4.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.50...9.60

Del. quantity cm<sup>3</sup>/ : 21.0...21.2

100 s : (20.7...21.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 4.5...4.9

Del. quantity cm<sup>3</sup>/ : 1.7...2.3

100 s : (1.5...2.5)

Spread cm<sup>3</sup> : 0.7

100 s : (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.90...1.30

2nd speed rpm : 500  
 travel mm : 2.60...3.20

3rd speed rpm : 800  
 travel mm : 4.90...5.50

4th speed rpm : 1150  
 travel mm : 8.20...8.40

5th speed rpm : 1300  
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1200  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 1200  
Del. quantity : 210.0...212.0  
1000 : (207.0...215.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 8.50  
Speed rpm : 1120...1130  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 76...84

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 300  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 9.50...9.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 6.90...7.10  
2nd pressure hPa : 260  
Rack travel in m: 7.10...7.20  
3rd pressure hPa : 560  
Rack travel in m: 8.80...9.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1100

Del. quantity cm<sup>3</sup>/ : 182.0...188.0  
1000 s: (179.0...191.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 130.5...132.5  
1000 s: (127.5...135.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.50  
Speed rpm : 1120...1130

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.50...4.70

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL  
 Edition : 18.12.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 846 055  
 Injection pump  
 Pump designation : PE6P110A32ORS8009-1  
 EP type number : 0 412 816 011  
 Governor  
 Governor design. : RQV300...1200PA1043  
 Governor no. : 0 421 814 024

Customer-spec. information  
 Customer : VME

Engine : TD73KCE

1st version kw : 186.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 078

Inlet press., bar : 2.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90  
 : (3.75...3.95)  
 Rack travel in mm : 9.00...12.00  
 F.ring order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 19.7...19.9

100 s: (19.5...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.3...4.7

Del.quantity cm<sup>3</sup>/ : 2.2...2.6

100 s: (1.9...2.9)

Spread cm<sup>3</sup> : 0.7

100 s: (1.1)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.90...1.30

2nd speed rpm : 500  
 travel mm : 2.60...3.20

3rd speed rpm : 800  
 travel mm : 4.60...5.30

4th speed rpm : 1250  
 travel mm : 8.10...8.30

5th speed rpm : 1400  
 travel mm : 9.60...10.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1260

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1300

Del.quantity : 197.0...199.0  
1000 : (195.0...201.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 10.80  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1330...1360  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 77...85

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 300...370

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.40...7.60  
2nd pressure hPa : 240  
Rack travel in m: 7.60...7.70  
3rd pressure hPa : 920  
Rack travel in m: 11.20...11.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 113.0...115.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1240...1250

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.30...4.50

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 f  
 Edition : 11.03.93  
 Replaces : 22.01.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 246 030  
 Injection pump  
 Pump designation : PES6MW100/720RS1511  
 EP type number : 0 413 206 011  
 Governor  
 Governor design. : RQ300/1300MW105-9  
 Governor no. : 0 420 082 061

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM366LA

1st version kw : 177.0  
 Rated speed : 2600  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)

Rack travel in mm : 21.00...0.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 13.40...13.50  
 Del. quantity cm<sup>3</sup>/ : 13.0...13.2  
 100 s: (12.8...13.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 4.2...4.4  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 1000  
 Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1200  
 Del. quantity : 130.0...132.0  
 1000 : (128.0...136.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version

Setting point:  
 Speed rpm : 1000  
 Rack travel in mm : 15.5

Testing:

1st rack travel in: 12.40  
 Speed rpm : 1345...1360  
 2nd rack travel in: 4.00  
 Speed rpm : 1445...1475  
 4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 4.3

Testing:

Speed rpm : 200

Minimum rack travel: 6.00

Speed rpm : 300

Rack travel in mm : 4.20...4.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 7.80...7.90

Measurement

Speed 1/min : 500

1st pressure hPa : 300

Rack travel in m: 8.50...8.70

2nd pressure hPa : 600

Rack travel in m: 10.60...10.80

3rd pressure hPa : 1200

Rack travel in m: 13.40...13.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 122.5...125.5

1000 s: (120.0...128.0)

Spread cm<sup>3</sup> : 5.00

1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 46.0...48.0

1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1345...1360

M26

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 115.0...125.0

1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.20...4.40

Del.quantity cm<sup>3</sup>/ : 10.0...14.0

1000 s: (7.5...16.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 21.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449AC  
 Injection pump  
 Pump designation : PES6A1000320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201  
 Cust. part no. : 3352893-VERSA002

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 l

1st version kW : 134.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100  


---

 Rack travel in mm : 10.20...10.30  


---

 Del.quantity cm<sup>3</sup>/ : 8.7...8.9  
 100 s: (8.5...9.1)  


---

 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  


---

 2nd speed rpm : 400.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 87.5...89.5  
 1000 : (85.5...91.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 750  
Rack travel in m: 12.10...12.30  
4th speed rpm : 950  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 101.0...104.0  
1000 s: (98.5...106.5)  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 115.0...118.0  
1000 s: (112.5...120.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 9.5...13.5  
1000 s: (7.0...16.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 21.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449CA  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Cust. part no. : 3915294-VERSA020

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CTA 8.3 L

1st version kW : 164.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.50...11.60

Del. quantity cm<sup>3</sup>/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.9...6.1

Del. quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 85...93

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 585...645

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 500  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 750  
Rack travel in m: 12.20...12.40  
4th speed rpm : 950  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 102.5...105.5  
1000 s: (100.0...108.0)  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 119.0...122.0  
1000 s: (116.5...124.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 21.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 450AJ  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV375...1150A2C2210  
 R  
 Governor no. : 9 420 083 202

Cust. part no. : 3353250-VERSA009

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 C 8.3 L

1st version kW : 120.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.70...10.80

Del. quantity cm<sup>3</sup>/ : 9.2...9.4

100 s : (9.0...9.6)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 5.1...5.3

Del. quantity cm<sup>3</sup>/ : 0.9...1.3

100 s : (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del. quantity : 92.0...94.0

1000 : (90.0...96.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 94...102

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1335...1365  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 4.7

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 535...595

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 600  
Rack travel in m: 11.80...12.00  
4th speed rpm : 900  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 100.5...103.5  
1000 s: (98.5...105.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 99.5...102.5  
1000 s: (97.0...105.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

#### APPLICATION

Installation 2300

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM  
 Edition : 21.01.93  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 083 452DH

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -2

EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1250AB1225R  
 Governor no. : 9 420 080 224

Cust. part no. : 3355244-VERSA037

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 157.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.50...11.60

Del. quantity cm<sup>3</sup>/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del. quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1265

travel mm : 8.40...8.60

2nd speed rpm : 900

travel mm : 5.50...6.00

3rd speed rpm : 500

travel mm : 3.70...4.20

4th speed rpm : 350

travel mm : 1.80...2.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/ : 108.0...110.0  
1000 : (106.0...112.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

#### Testing:

1st rack travel in: 10.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 9.80  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 350...500

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 500  
Rack travel in m: 12.10...12.20  
3rd speed rpm : 750  
Rack travel in m: 12.10...12.20  
4th speed rpm : 900  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 105.0...108.0  
1000 s: (102.5...110.5)

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 115.0...118.0  
1000 s: (112.5...120.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 156.0...186.0  
1000 s: (151.0...191.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 12.5...16.5  
1000 s: (10.0...19.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 x  
 Edition : 11.01.93  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 459  
 Injection pump  
 Pump designation : PES6A95D12ORS2822  
 EP type number : 9 400 084 029  
 Governor  
 Governor design. : RQV350...1250AB1235-  
 2R  
 Governor no. : 9 420 080 311

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 BT

1st version kW : 119.3  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00x2.00x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.00...3.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.70...12.80

Del. quantity cm<sup>3</sup>/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del. quantity cm<sup>3</sup>/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 6.80...6.90

2nd speed rpm : 350

travel mm : 1.20...1.70

3rd speed rpm : 700

travel mm : 4.00...4.50

4th speed rpm : 1550

travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1530

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250  
Aneroid pressure h: 600  
Del. quantity : 86.0...88.0  
1000 : (84.0...90.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 107...115

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1545...1575  
4th rack travel in: 1750  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 63...71

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 475...575

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.90  
2nd pressure hPa : 320  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 410  
Rack travel in m: 12.30...12.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 600  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 80.0...83.0  
1000 s: (77.5...85.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 64.0...67.0  
1000 s: (62.0...69.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 115.0...135.0  
1000 s: (110.0...140.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.00...5.20  
Del. quantity cm<sup>3</sup>/ : 6.0...10.0  
1000 s: (4.0...12.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

: C.D.C # 3355264

Start-of-delivery mark 9.5° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM  
 Edition : 05.03.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 241  
 Injection pump  
 Pump designation : PES3A90D320RS2703  
 EP type number : 9 400 083 096  
 Governor  
 Governor design. : RSV350...1150A2C2129  
 -4R  
 Governor no. : 9 420 083 268

Customer-spec. information  
 Customer : MWM

Engine : D 229-3

1st version kW : 42.7  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)

NO9

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.50...8.60

Del. quantity cm<sup>3</sup>/ : 5.8...5.9

100 s: (5.6...6.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del. quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 58.0...59.0

1000 : (56.0...61.0)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever  
position degrees: 93...101

Testing:  
1st rack travel in: 7.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 550...610

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.50...8.60  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.50  
4th speed rpm : 800  
Rack travel in m: 8.90...9.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (51.5...58.5)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 60.5...62.5  
1000 s: (58.0...65.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 7.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

Remarks:  
: VALMET  
APPLICATION  
Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM  
 Edition : 05.03.93  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 085 272

Injection pump  
 Pump designation : PES4A90D32ORS2744  
 EP type number : 9 400 084 012  
 Governor  
 Governor design. : RSV350...1300A2C2215  
 -2R  
 Governor no. : 9 420 083 275

Customer-spec. information  
 Customer : MWM

Engine : TD 229-4

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1300

---

Rack travel in mm : 10.60...10.70

---

Del. quantity cm<sup>3</sup>/ : 8.9...9.0

---

100 s: (8.7...9.2)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300

Del. quantity : 89.0...90.0

1000 : (87.0...92.0)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 105...113

Testing:

1st rack travel in: 9.60  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1600  
Speed rpm : 6.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 540...600

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.60...10.70  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.30  
3rd speed rpm : 800  
Rack travel in m: 10.90...11.20  
4th speed rpm : 900  
Rack travel in m: 10.80...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 89.0...91.0  
1000 s: (86.5...93.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.60  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

N12

Speed rpm : 350  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM  
 Edition : 05.03.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 332  
 Injection pump  
 Pump designation : PES6A90D320RS2727  
 EP type number : 9 400 084 007  
 Governor  
 Governor design. : RSV350...1200A2C2097  
 R  
 Governor no. : 9 420 083 279

Customer-spec. information  
 Customer : MWM

Engine : D 229 EC 6

1st version kW : 90.8  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.10...9.20

Del.quantity cm3/ : 5.9...6.0

100 s: (5.7...6.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 59.5...60.5

1000 : (57.5...62.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever  
position degrees: 90...98

Testing:

1st rack travel in: 8.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.10...9.20  
2nd speed rpm : 500  
Rack travel in m: 10.10...10.20  
3rd speed rpm : 800  
Rack travel in m: 9.70...9.90  
4th speed rpm : 1000  
Rack travel in m: 9.30...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 55.5...57.5  
1000 s: (53.0...60.0)  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 62.0...64.0  
1000 s: (59.5...66.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 8.10  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

APPLICATION

Tractor (tractor engines)



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : M/M  
 Edition : 26.02.93  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 349  
 Injection pump  
 Pump designation : PES6A95D410RS2812  
 EP type number : 9 400 084 028  
 Governor  
 Governor design. : RQV350...1250AB1260  
 -1L  
 Governor no. : 9 420 080 330

Customer-spec. information  
 Customer : M/M

Engine : 6.10 T

1st version kw : 129.5  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 1.50...2.50

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 9.1...9.3

100 s: (8.9...9.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.6...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.10...7.30

2nd speed rpm : 300

travel mm : 0.80...1.30

3rd speed rpm : 550

travel mm : 2.50...3.00

4th speed rpm : 800

travel mm : 3.70...4.20

5th speed rpm : 1500

travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1490

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 800  
Del. quantity : 91.5...93.5  
1000 : (89.5...95.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 106...114

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1300...1310  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1630  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 325...475

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 750  
Rack travel in m: 12.10...12.20  
3rd speed rpm : 900  
Rack travel in m: 12.10...12.20  
4th speed rpm : 1050  
Rack travel in m: 11.90...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 12.10...12.20

Measurement  
Speed 1/min : 500

N16

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 380  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 480  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 91.0...94.0  
1000 s: (89.0...96.0)  
Aneroid pressure h: 800  
Speed rpm : 900  
Del. quantity cm<sup>3</sup>/ : 94.5...97.5  
1000 s: (92.5...99.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 72.0...74.0  
1000 s: (70.0...76.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1300...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.30  
Del. quantity cm<sup>3</sup>/ : 7.5...11.5  
1000 s: (6.0...13.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 387  
 Injection pump  
 Pump designation : PES5P120A72DLS7174  
 -10  
 EP type number : 0 412 725 815  
 Governor  
 Governor design. : RG300/1050PA774-2  
 Governor no. : 0 421 801 450

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM449 A

1st version kW : 184.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del. quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...7.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 650

Del. quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.40...7.00  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 14.40...14.60  
2nd speed rpm : 750  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600  
1st pressure hPa : 250  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 400  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 750  
Rack travel in m: 14.20...14.30  
4th pressure hPa : 850  
Rack travel in m: 14.60...14.80  
5th pressure hPa : -  
Rack travel in m: 11.90...12.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

N18

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 208.0...211.0  
1000 s: (205.0...214.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
1000 s: (213.0...223.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB  
 Edition : 11.01.93  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 390  
 Injection pump  
 Pump designation : PES6P120A720LS7114  
 -13  
 EP type number : 0 412 726 867  
 Governor  
 Governor design. : RQ300/1050PA911  
 Governor no. : 0 421 801 476

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 LA

1st version kW : 257.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 700  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 600  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80  
4th pressure hPa : 1100  
Rack travel in m: 13.90...14.10  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

N20

Del.quantity cm<sup>3</sup>/ : 229.0...233.0  
1000 s: (226.0...236.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 244.0...247.0  
1000 s: (241.0...250.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 5.0 B  
Edition : 16.03.93  
replaces : 20.07.87  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1500R266-1  
Type number : 0 460 414 042  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : MARINE NA 3000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.5  
(from BDC): ±0.02(0.04)

Indicator setting  
Piston stroke mm: 1.47  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Setting value mm: 2.40...2.80

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 4.90...5.50

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 23.00...24.00  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 11.00...15.00  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/  
1000S.: 12.00...18.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...100.00  
mind 1000S.: 70.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 3.70...4.50  
mm: (3.40...4.80)  
3rd speed 1/min: 1100  
TD travel mm: 2.40...2.80  
mm: (1.90...3.30)  
4th speed 1/min: 700  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)  
5th speed 1/min: 1350  
TD travel mm: 3.40...4.20  
mm: (3.10...4.50)

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 3.50...4.10  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.90...5.50  
3rd speed 1/min: 1500

Supply-pump  
pressure bar: 6.40...7.00

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 1500  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

Delivery-quant. and breakaway char.:

3rd speed 1/min: 1650  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)  
5th speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/1000s.: 12.00...18.00  
(10.00...20.00)  
9th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/1000s.: 47.00...50.00  
(45.50...51.50)  
10th speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/1000s.: 47.50...50.50  
(46.00...52.00)  
12th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/1000s.: 23.00...24.00  
(21.00...26.00)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)

Shutoff  
electromagnet volt: -

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
(0.00...3.00)

Shutoff  
electromagnet volt: 12

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000s.: 11.00...15.00  
(9.00...17.00)

Dispersion cm<sup>3</sup>/1000s.: 3.0  
(3.0)

2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000s.: 3.00...9.00  
(1.50...10.50)

3rd speed 1/min: 460

Del. quantity cm<sup>3</sup>/1000s.: 0.00...5.00  
(0.00...5.00)

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/1000s.: 36.00...52.00  
(14.00...30.00)

2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000s.: 24.50...39.50  
(MAX.39.5)

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/1000s.: 70.00...100.00  
(MIN.70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: K-OT  
MS1 mm: 1.60  
SVS max. mm: 3.8

Remarks:

:  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 15.03.93  
replaces : 02.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R342  
Type number : 0 460 414 067  
Customer Part-No. :

Customer-specific information  
Customer : S0FIM

Engine : 8140.07.2700

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.3  
(from BDC): (+0.02(0.04))

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 525  
Del. quantity cm<sup>3</sup>/  
1000S.: 27.00...28.00 F

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000S.: 54.00...55.00 E

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.0  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/  
1000S.: 18.00...22.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 12  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -13.3...15.3 #  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1100  
Supply pump  
pressure  
difference bar: -0.10...0.30#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 4.10...4.90  
mm: (3.90...5.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 3.10...3.50  
mm: (2.70...3.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
TD travel mm: 0.60...1.40  
mm: (0.40...1.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.70...6.30  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1500  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 69.50...111.20  
(55.50...125.20)

2nd speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 83.40...180.70  
(69.40...194.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...5.00  
-

5th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 18.00...22.00  
(15.50...24.50)

8th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 32.00...40.00  
(30.00...42.00)

9th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 48.00...53.00  
(47.00...54.00) D

10th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 53.20...58.20  
(52.20...59.20)

12th speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 27.00...28.00  
(24.00...31.00) F

18th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 54.00...55.00  
(51.00...58.00) E

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00  
-

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 10.50...14.50  
(8.50...16.50)

Dispersion cm<sup>3</sup>/1000s.: 3.0  
(3.5)  
2nd speed 1/min: 600  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...2.00  
1000S.: -  
3rd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: -  
5th speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.00...36.00  
1000S.: (25.00...37.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1100  
Inj.-qty. cm<sup>3</sup>/: -16.5..24.5 \*  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1100  
Inj.-qty. cm<sup>3</sup>/: MAX. ..8.00 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1100  
TD-travel : -0.40..0.60 \*  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD-travel : -0.0...0.80 "  
difference mm: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...60.00  
1000S.: (40.00...60.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...40.00  
1000S.: (10.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -  
KF mm: K-OT  
MS mm: 0,0...1,2  
SVS max. mm: 3,5  
HBA stroke mm: 7,2

Remarks:

:  
:  
F = Adjustment point for low full-load  
delivery  
E = Fuel-delivery adjustment point in  
HBA range. (Correction by way of HBA  
adjusting screw).  
D = Adjustment point for high full-  
load delivery